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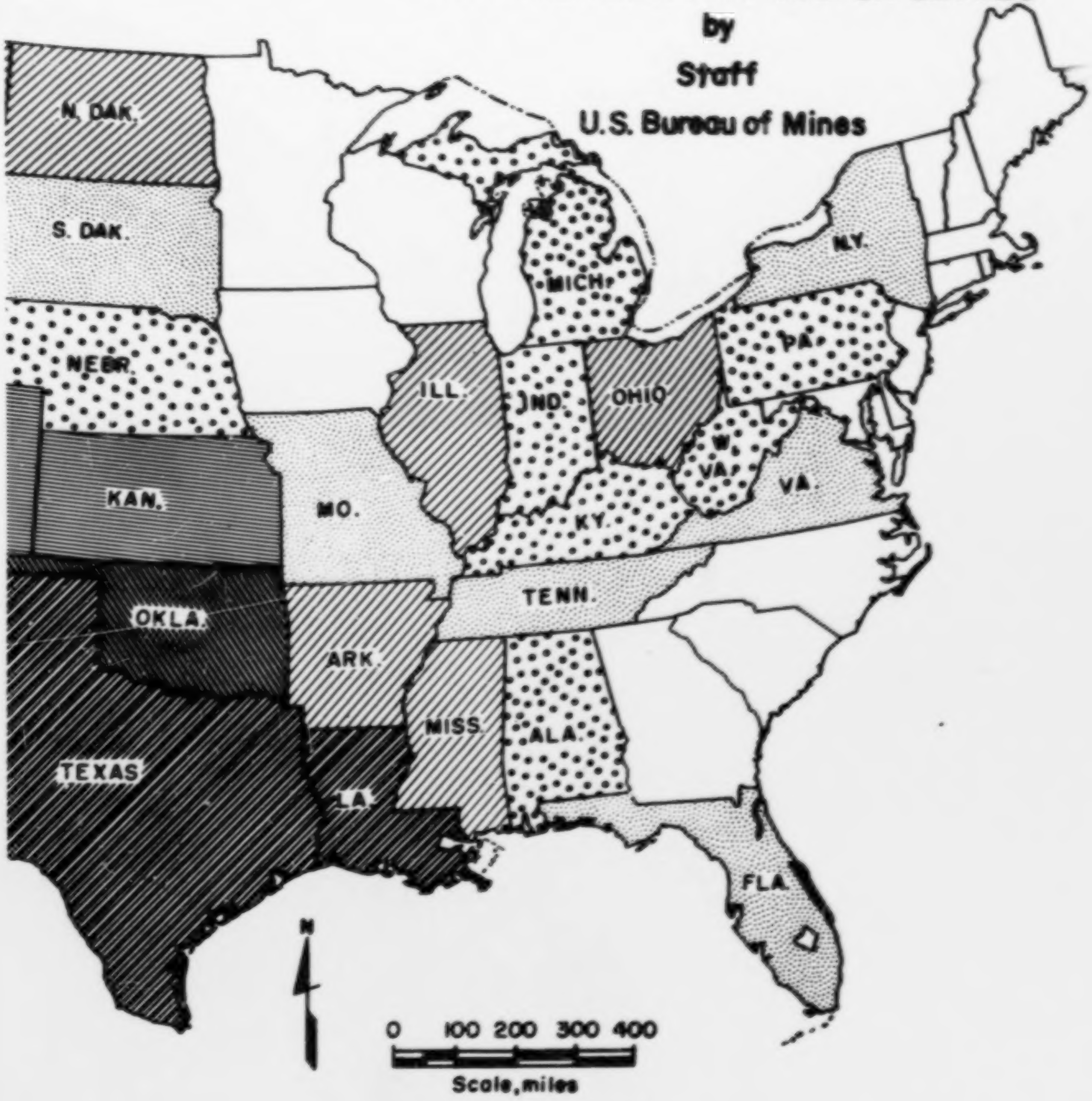
OIL AVAILABILITY BY SULFUR LEVELS

by

Staff

U.S. Bureau of Mines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OIL AVAILABILITY BY SULFUR LEVELS

Prepared by the Bureau of Mines
for
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Office of Air Programs

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OIL AVAILABILITY BY SULFUR LEVELS

by

BUREAU OF MINES

ABSTRACT

This report presents information pertaining to the sulfur content of crude oil reserves, production, and selected refined products are presented by geographical areas. Crude oil reserves (as of December 31, 1969) and 1969 production were classified by sulfur content as were refinery receipts. Quantity and sulfur content of stocks and shipments of selected refinery products was determined; also tabulated was sulfur content of stocks held at bulk terminal storage facilities. Domestic and foreign desulfurization operations were tabulated and technology discussed.

Reserve estimates were made for more than one thousand individual reservoirs in 28 States which represent a 67-percent sample of total United States crude oil reserves. Information on crude oil production was available for most of the 31 oil-producing States. Crude oil analyses were available for sulfur content classifying for about 80 percent of the total United States crude oil production. The 80-percent sample was from 29 States. Based upon this classification of reserve and production samples, the remaining reserve and production were apportioned to four sulfur content ranges. Results of the total reserve and production classifications indicated 63.8 percent of the reserves

and 70.3 percent of the production contained less than 0.50 percent sulfur, 11.8 percent of the reserves and 11.3 percent of the production contained between 0.51 and 1.00 percent sulfur, 17.4 percent of the reserves and 10.6 percent of the production contained between 1.01 and 2.00 percent sulfur, and 7.0 percent of the reserves and 7.8 percent of the production contained greater than 2.00 percent sulfur.

Refinery receipts were classified by the area from which the crude oil originated and distribution of selected refinery products was determined. Seventy percent of the 1969 crude oil production came from Texas, Louisiana, and California with another 25 percent coming from eight other States. The other 5 percent came from the remaining 20 States. Sulfur levels of residual fuel oil shipments for the first quarter of 1971 were: 0 to 0.5 percent, 15.4 million barrels; 0.6 to 1.0 percent, 19.8 million barrels; 1.0 to 2.0 percent, 34.5 million barrels; and over 2.0 percent, 19.8 million barrels. Relatively few refineries manufactured No. 4 fuel oil and the total for the quarter was 3.8 million barrels with over 75 percent of the shipments in the 0 to 0.5 percent sulfur range. Stocks of No. 4 and residual fuel oils held at refineries averaged about 1.4 million and 26 million barrels, respectively, each month; about 65 percent of the residual fuel oil contained over 1 percent sulfur. Some other refined products were discussed in relation to refinery output and consumption by use.

Pertinent data for reserves, production, refineries, and bulk terminals were incorporated into a national energy data bank. The computerized system contains reserve data, with sulfur content, on over 1,000 fields and production data for over 17,000 fields with sulfur data for over 3,600 fields. Refinery information consists of individual company data on capacity, input, output, stocks, and sulfur content of No. 4 and residual fuel oils. Bulk terminal information contains refined product stocks with sulfur data for No. 4 and residual fuel oils. Being included in the system is import data collected from the Office of Import Administration; the 1968 and 1969 summations indicated that over 99 percent of the imported residual fuel oil contained over 0.50 percent sulfur.

INTRODUCTION

Of the Nation's energy needs, 43 percent is derived from petroleum based upon Btu content. Continued expansion and growth in the United States is regulated by and largely dependent upon energy from petroleum and petroleum products, but environmental conditions have required an assessment of sulfur present in the petroleum reserves, production, and products. To obtain factual data and classify petroleum by sulfur levels the Office of Air Programs (OAP) contracted with the U.S. Bureau of Mines for a study of sulfur in various components of the petroleum industry. There are two principal objectives to this report contracted for by OAP. The first objective is to quantify the Nation's petroleum reserves and production in terms of sulfur content and by geographical areas.

Determination of input of crude oil to the 262 operating refineries (as of December 31, 1969), subsequent volumes of selected products produced and distributed, sulfur content of No. 4 and residual fuel oils constitute the other objectives. The purpose of quantifying the crude oil reserves and production, establishing the consumption at refineries, and determining the volumes of fuel oils produced is to provide OAP with factual data concerning sulfur levels in crude oil and selected refined products. These data are incorporated into a data bank and maintained with new information as available.

In order to preserve individual company confidential data various geographical divisions and subdivisions were established for the United States. Compatability of the divisions was attempted; in general, States were the common base. Crude oil production and reserve data were presented for 37 geographical areas comprised of State, combination of States, subdivisions of States, and combinations of a State with a geographical subdivision of another State. Crude oil production was further subdivided by individual counties within a State. Refinery districts within Petroleum Administration for Defense (PAD) districts were selected as the primary division for refinery and bulk terminal information, and where possible finer subdivisions were made.

Information on 1969 production was available for most of the 31 oil-producing States, and crude oil analyses were available for most of the oil production. Information on reserves, however, had to be calculated or updated. Reserve estimates were made for more than 1,000 individual reservoirs representing a 67 percent sample of the total crude oil reserve (API) in the United States. Geographically, the sample included fields from 28 States; none of the principal oil-producing States were omitted. Crude oil analyses with sulfur content were available for the classification of 80 percent of the 1969 oil production; the sample of production was from 29 States. Results of production and reserves were classified by sulfur content according to geographical area.

Refinery and bulk terminal data, reported by PAD and refinery districts, include quantity by sulfur content of residual and No. 4 fuel oils with the number of companies contributing. Where less than five companies contributed to the total quantity, the number of companies was withheld to preserve company confidentiality. The individual company data incorporated into the data bank was tabulated in various categories and are presented in tables. Methods utilized were simple and direct with no attempt to establish trends, averages, or any statistical parameters because of sulfur data for only four months. The data available for this study were:

1. March, June, September, and December 1970 individual refinery reports.

2. December 1970, January, February, and March 1971 sulfur data for residual and No. 4 fuel oils.

3. Refinery capacity reports as of January 1, 1970.

4. Bulk terminal stocks of finished products for January, February, and March 1971, and December 1970.

5. Bulk terminal stocks of residual and No. 4 fuel oils by sulfur levels for December 1970 and January, February, and March 1971.

From the limited quantity of sulfur data, particularly the time covered (four months), only factual presentation of quantities was attempted for refinery information in this report. It became obvious from this study that with more historical information a much more comprehensive and useful report would be possible. For example, a full year (at least) of residual and No. 4 fuel oil by sulfur level would indicate seasonal trends, distribution, demand, and other facets of consumption.

Flow patterns are essentially divided into two parts: the quantity of crude oil received at refineries and the products shipped from refineries. The crude oil received by refineries was 3,189 million barrels in 1969 from which many products were manufactured, and in 1970, both input and output increased. Distribution of crude oil to the 262 operating refineries and subsequent product shipments to consumers was accomplished via pipelines, railroads, trucks, and water transportation.

Under terms of the contract with OAP a data bank was established and is to be maintained and updated periodically by the Bureau of Mines. This system contains reserve and production data by fields and refinery and bulk terminal data by individual company. The system contains six years historical production information for approximately 17,219 fields and reserve data, as of December 31, 1969, for over 1,000 fields. Data relative to refineries include four months (December 1970, January, February, March 1971), and capacities of individual refineries. Stocks of finished petroleum products held at bulk terminals for January, February, and March 1971 with sulfur levels for No. 4 and residual fuel oils by individual companies comprises the data bank for bulk terminals. Information derived from the Office of Import Administration (OIA) concerning quantities of residual fuel oil according to sulfur levels by individual company, port of entry, and country of origin for 1968 and 1969 was incorporated into the data bank.

CHAPTER 1.--DOMESTIC CRUDE OIL PRODUCTION AND RESERVE

CRUDE OIL SUPPLY

To provide basic data pertaining to crude oil supply by sulfur content for incorporation into a computerized data system, proved reserves (as of December 31, 1969) of selected fields (or reservoirs) were estimated and 1969 production data were compiled by the Bureau of Mines. The system classified segments of the overall crude oil reserves and production by sulfur content according to geographical areas. Based on the classifications obtained, the remaining reserves and production were apportioned according to four sulfur content ranges. Results of the total reserve 1/ and production classifications indicated 63.8 percent of the reserves and 70.3 percent of the production contained less than 0.50 percent sulfur, 11.8 percent of the reserves and 11.3 percent of the production contained between 0.51 and 1.00 percent sulfur, 17.4 percent of the reserves and 10.6 percent of the production contained between 1.01 and 2.00 percent sulfur, and 7.0 percent of the reserves and 7.8 percent of the production contained greater than 2.00 percent sulfur.

METHODOLOGY

Production figures and some information used to estimate reserves were obtained from data published in State oil and gas reports or in other literature. Because of the methods used in reporting production, most

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1/ Total reserve by areas (not available from the Bureau of Mines) is that published by the American Petroleum Institute.

production was obtained on a field total basis and some on a reservoir total basis. In tabulating results, the totals of the data shown are from fields and reservoirs. Thus, the term field (or reservoir) was used in this report to denote the totals obtained.

Of approximately 5,500 fields which have Bureau of Mines crude oil analyses with sulfur content, about 1,000 fields (or reservoirs) were selected from most of the Nation's oil-producing areas to estimate crude oil reserves. Sulfur content of the production from an additional 2,600 fields (or reservoirs) was included in this report. Previously, the Bureau of Mines categorized sulfur content of crude oil by ranges and correlated this with oil production. This report differs from the previous Bureau of Mines studies in that the sulfur content of crude oil is also related to field reserves.

In selecting fields (or reservoirs) for reserve estimates, an effort was made to ascertain sulfur content of the reserves of a minimum of 50 percent of the crude oil production in each geographical area; however, this was found not feasible because of a time element and lack of crude oil analysis in some areas. Thereafter, only fields with 100,000 barrels-per-year production and a relevant analysis were considered. Production rate criterion was lowered as necessary to include at least a crude oil sulfur content in each geographical area where possible.

Method of Assigning Sulfur Content

In considering the sulfur content of a field (or reservoir) only one Bureau of Mines crude oil analysis was selected to be representative of each field (or reservoir). Where more than one reservoir were producing in a field and production was reported as a field total, the crude oil analysis chosen was judged to be representative of that expected from a composite sample from the producing reservoirs.

Methods of Estimating Proved Reserves

There are three methods commonly employed by reservoir engineers to calculate reserves of petroleum. The volumetric method and material balance method require considerable reservoir data and time. The production decline method requires a minimum amount of data and time and is used most frequently, but the accuracy is very dependent on the knowledge and skill of the reservoir engineer using it.

In making the reserve estimates for more than one thousand fields (or reservoirs) for use in this study, all three of the described methods were employed to some extent. The method most frequently used was the production decline using mathematical equations which took into consideration rates of production and reservoir characteristics[2/]. When using the volumetric method, recovery factors were derived from published data[3/]. In some cases, oil reserves from published and unpublished sources were used, and only a preliminary check was made to verify estimates.

SULFUR CONTENT OF OIL IN THE UNITED STATES

The assessment of sulfur content in current and future domestic

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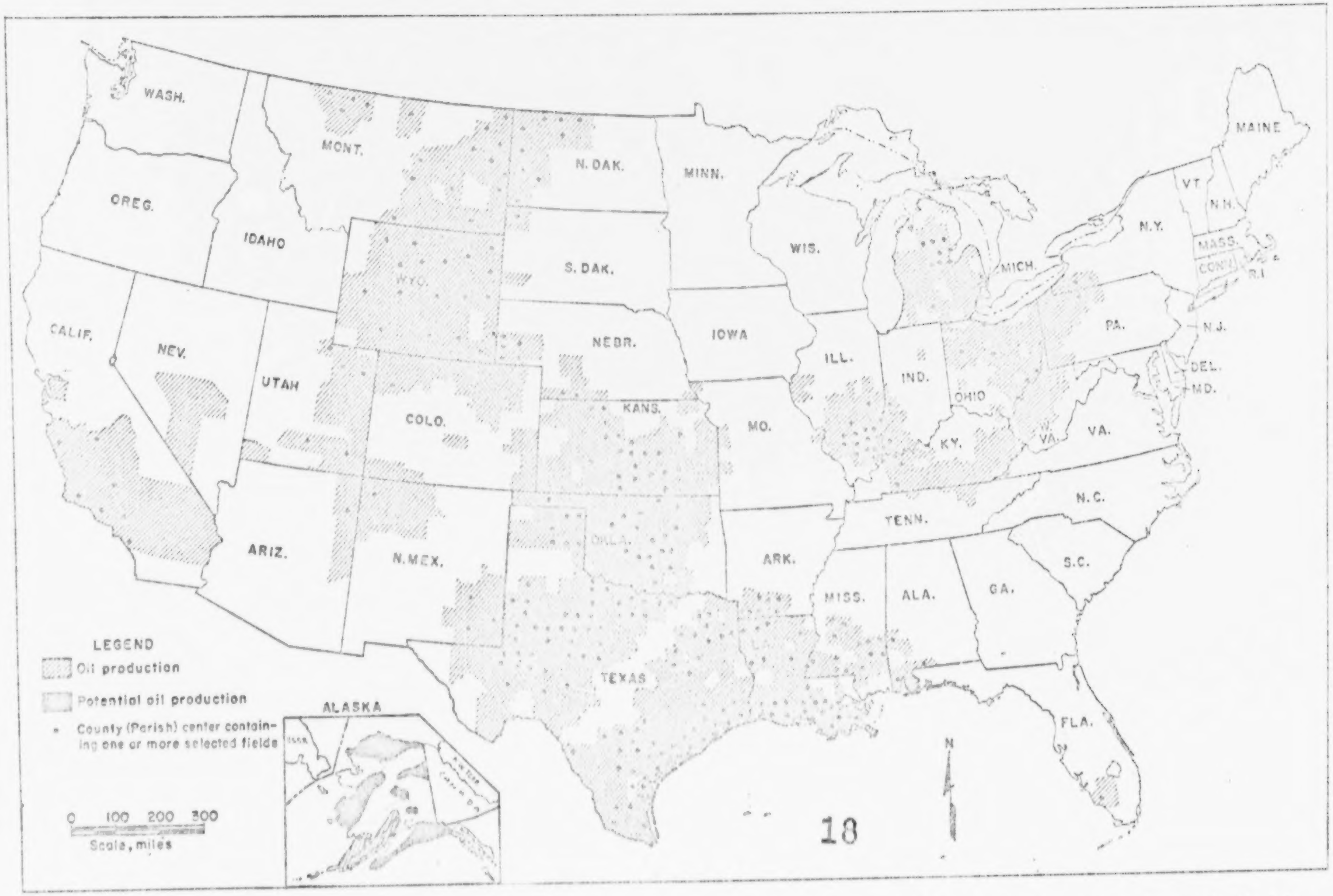
[2/] Arps, Jan J. Estimation of Primary Oil and Gas Reserves. Petroleum Production Handbook, ed. by Thomas C. Frick, McGraw-Hill Book Co., Inc., New York, N. Y., v. 2, 1962, pp. 37-12 to 37-52.

[3/] American Petroleum Institute. A Statistical Study of Recovery Efficiency. Bull. D14, October 1967, 33 pp.

crude oil production will be necessary to assist in the abatement of air pollution. Currently, the principal method for reducing sulfur oxide emissions from fossil fuel combustion sources is the utilization of low-sulfur fuels (natural gas, low-sulfur fuel oil, and low-sulfur coal). Data pertaining to the sulfur content of the fossil fuels are needed to facilitate substitution of fossil fuels with lower sulfur content in areas of air quality control. This study pertains to the sulfur content in crude oil, the most important fossil fuel.

Classification of Oil Reserves from Selected Fields

The selected fields (fields with reserve estimates) included in this study are shown in figure 1. Each dot on the map represents one or more selected fields within a county or parish of the State. These selected fields had a crude oil reserve of 19,754 million barrels (67 percent of the total reserve) and produced about 1,921 million barrels of oil (60 percent of the 1969 production). The oil reserves of the selected fields (or reservoirs) were summarized according to four sulfur content ranges as shown in table 1. Most of the oil reserve (12,145 million barrels) in the selected fields (or reservoirs) was in the 0 to 0.5 percent sulfur content range, and production associated with this reserve was 1,216 million barrels. Eight geographical areas had about 75 percent of the reserve in the 0 to 0.5 percent sulfur content range as follows: Louisiana, south (2,687 million barrels); Texas Railroad Commission (RRC) district 6 (2,100 million barrels); Texas RRC district 8A (1,241 million barrels); Texas RRC district 3 (921 million barrels); Texas RRC district 2 (675 million barrels); Oklahoma (592 million barrels);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FLA.
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N
LEGEND
▨ Oil production
▨ Potential oil production
• County (Parish) center containing one or more selected fields
0 100 200 300
Scale, miles

FIGURE 1.--Oil production, potential production, and county or parish location of selected fields with sulfur content of crude oil reserves in the United States--December 31, 1969

TABLE 1. - Classification of crude oil reserves of selected fields by sulfur content in the United States--December 31, 1969

Geographical area[1]	Reserves, 1,000 bbl				
	Sulfur content, percent				
	0.00-0.50	0.51-1.00	1.01-2.00	>2.00	Total
Alabama and Florida........	58,300	699	-	8,054	67,053
Alaska.....................	432,300	-	-	-	432,300
Arkansas...................	3,284	4,914	65,003	9,999	83,200
California					
Coastal..................	347	109,000	6,980	103,810	220,137
Los Angeles Basin........	9,055	32,180	1,293,972	47,830	1,383,037
San Joaquin..............	306,835	718,230	425,100	-	1,450,165
Colorado...................	35,460	169,000	-	-	204,460
Illinois...................	219,097	-	-	-	219,097
Indiana....................	18,748	154	-	-	18,902
Kansas and Missouri........	126,230	58,383	752	-	185,365
Kentucky and Tennessee.....	11,720	-	-	-	11,720
Louisiana					
North....................	133,510	17,760	-	-	151,270
South....................	2,686,976	44,600	-	-	2,731,576
Michigan...................	30,175	2,709	-	-	32,884
Mississippi................	13,689	28,090	8,340	7[illegible]570	121,689
Montana....................	134,001	55,933	47,867	3,670	241,471
Nebraska...................	9,528	17,254	-	-	26,782
New Mexico Southeast.......	239,714	91,000	135,630	-	466,344
New Mexico Northwest and Arizona..............	17,989	-	-	-	17,989
North Dakota...............	123,683	37,700	1,810	17,789	180,982
Ohio, New York, and Pennsylvania..............	115,060	261	-	-	115,321
Oklahoma...................	591,521	275,900	-	-	867,421
Texas					
District 1...............	21,562	78,009	960	-	100,531
District 2...............	674,592	5,420	-	-	680,012
District 3...............	920,822	-	-	-	920,822
District 4...............	299,983	-	-	-	299,983
District 5...............	12,210	118,860	-	-	131,070
District 6...............	2,099,610	15,700	17,600	272,100	2,405,010
District 7B..............	110,354	-	-	-	110,354
District 7C..............	191,112	3,243	-	4,890	199,245
District 8...............	434,720	18,800	1,460,820	215,100	2,129,440
District 8A..............	1,241,400	80,750	595,200	132,850	2,050,200
District 9...............	92,189	48,216	-	-	140,405
District 10..............	172,588	-	-	-	172,588
Utah and Nevada............	169,359	2,470	5,020	-	176,849
West Virginia and Virginia.	53,486	-	-	-	53,486
Wyoming and South Dakota...	334,072	40,485	183,567	396,224	954,348
Total....................	12,145,281	2,075,720	4,248,621	1,283,886	19,753,508

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[1] Geographical area is a state, combination of states, subdivision of a state, and combination of a state and geographical subdivision of another state.

Texas RRC district 8 (435 million barrels); and Alaska, excluding North Slope reserves, (432 million barrels). The 1.01 to 2.00 percent sulfur content range had the second highest oil reserve of 4,249 million barrels with an associated production of 324 million barrels. In this higher sulfur content range, three geographical areas had 79 percent of the reserve as follows: Texas RRC district 8 (1,461 million barrels); California, Los Angeles Basin (1,294 million barrels); and Texas RRC district 8A (595 million barrels). Of the remaining reserve, 2,076 million barrels was in the 0.51 to 1.00 percent sulfur content range and 1,284 million barrels was in the greater than 2.00 percent sulfur content range. The top seven geographical areas with 75 percent of the oil reserve in the 0.51 to 1.00 percent sulfur content range were: California, San Joaquin (718 million barrels); Oklahoma (276 million barrels); Colorado (169 million barrels); Texas RRC district 5 (119 million barrels); California, Coastal (109 million barrels); New Mexico, southeast (91 million barrels); and Texas RRC district 8A (81 million barrels). Areas with 74 percent of the reserve in the greater than 2.00 percent sulfur range were: Wyoming and South Dakota (396 million barrels); Texas RRC district 6 (272 million barrels); Texas RRC district 8 (215 million barrels); and Mississippi (72 million barrels).

Classification of Total Crude Oil Reserves

To classify the total crude oil reserves as of December 31, 1969, sulfur content was allocated to the remaining reserve (total API reserves minus Bureau of Mines selected field reserves). The above allocation was based on the sulfur content assigned to the reserves of 1,000 selected fields (or reservoirs) and that assigned to the production of the additional 2,600 fields not associated with selected fields (or reservoirs). As shown in table 2, the breakdown of U.S. reserve by sulfur content ranges was: 0 to 0.5 percent, 18,908 million barrels; 0.51 to 1.00 percent, 3,499 million barrels; 1.01 to 2.00 percent, 5,151 million barrels; and greater than 2.00 percent, 2,074 million barrels.

About 82 percent of the U.S. reserve was in Texas, Louisiana, California, and Oklahoma (fig. 2). The crude oil reserve from these four areas are classified in table 2 and total 15,779 million barrels of 0 to 0.5 percent sulfur content, 2,638 million barrels of 0.51 to 1.00 percent, 4,558 million barrels of 1.01 to 2.00 percent, and 1,410 million barrels greater than 2.00 percent.

Classification of 80 Percent of the 1969 Production

Sulfur content was assigned to a larger segment of the Nation's oil production than that associated with the estimated reserves because of the time required to estimate individual field reserves. About 80 percent of the production was assigned sulfur content and classified as shown in table 3. The lowest sulfur content range, 0 to 0.5 percent, had the largest production of 1,744 million barrels. Eight geographical areas with about 66 percent of the oil production in this low range were: Louisiana, south (476 million barrels); Oklahoma (120 million barrels); Texas RRC district 3 (110 million barrels); Texas RRC district 8 (109 million barrels); California, Los Angeles Basin (103 million barrels); Texas RRC district 6 (82 million barrels); Texas RRC district 8A (77 million barrels); and Alaska, including 277,000 barrels from the North

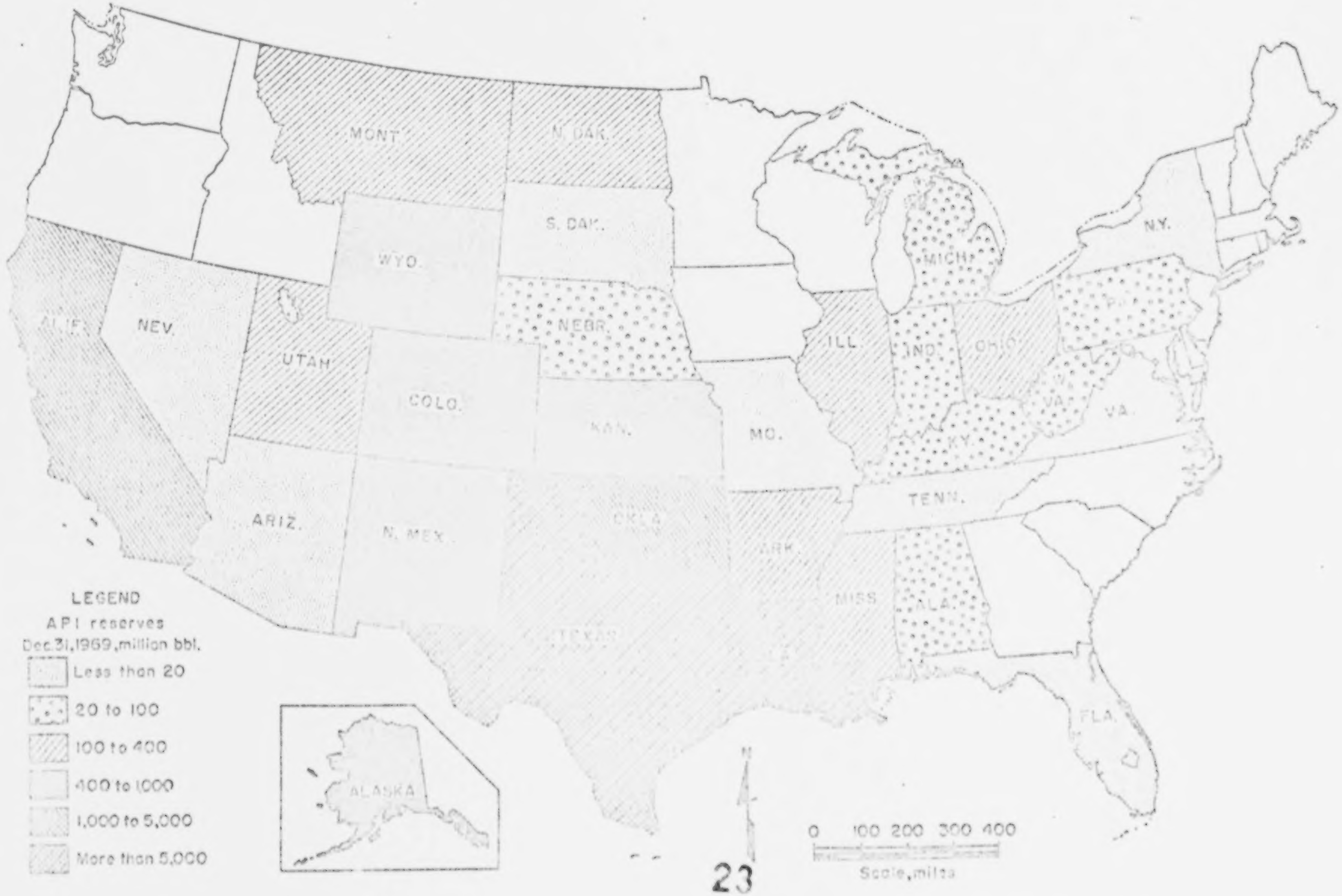
TABLE 2. - Classification of total crude oil reserves by sulfur content in the United States--December 31, 1969

Geographical area 1/	Reserves, 1,000 bbl				
	Sulfur content, percent				Total
	0.00-0.50	0.51-1.00	1.01-2.00	>2.00	
Alabama and Florida	64,414	776	-	8,899	74,089
Alaska	432,300	-	-	-	2/ 432,300
Arkansas	9,573	6,533	94,869	16,371	127,346
California					
Coastal	13,484	263,624	26,800	345,264	649,172
Los Angeles Basin	11,647	65,287	1,486,820	76,766	1,640,520
San Joaquin	461,318	973,174	518,546	-	1,953,038
Colorado	144,230	253,409	57	2,908	400,604
Illinois	271,867	248	-	-	272,115
Indiana	41,153	154	-	-	41,307
Kansas and Missouri	394,613	170,517	1,620	-	566,750
Kentucky and Tennessee	73,230	-	-	-	73,230
Louisiana					
North	289,881	37,879	5,424	-	333,184
South	5,130,053	225,913	-	-	5,355,966
Michigan	43,933	7,168	416	-	51,517
Mississippi	83,484	72,026	21,301	183,387	360,198
Montana	152,645	64,278	53,969	4,873	275,765
Nebraska	20,551	26,284	-	-	46,835
New Mexico Southeast	428,099	160,787	222,163	248	811,297
New Mexico Northwest and Arizona	38,369	-	-	-	38,369
North Dakota	142,256	52,031	4,050	36,167	234,504
Ohio, New York, and Pennsylvania	193,516	382	-	-	193,898
Oklahoma	999,031	389,806	1,146	-	1,389,983
Texas					
District 1	40,148	112,260	3,717	1,041	157,166
District 2	881,063	5,420	-	-	886,483
District 3	1,821,646	12,782	-	-	1,834,428
District 4	563,768	97	-	-	563,865
District 5	12,403	121,967	496	-	134,866
District 6	2,190,955	15,830	34,748	348,749	2,590,282
District 7B	242,444	-	-	-	242,444
District 7C	306,463	17,002	5,690	19,198	348,353
District 8	899,825	151,364	1,759,582	357,811	3,168,582
District 8A	1,457,499	132,717	714,763	261,199	2,566,178
District 9	222,178	113,389	-	-	335,567
District 10	234,968	-	-	-	234,968
Utah and Nevada	187,368	3,637	5,182	-	196,187
West Virginia and Virginia	53,486	-	-	-	53,486
Wyoming and South Dakota	353,635	42,378	189,711	411,296	997,020
Total	18,907,496	3,499,119	5,151,070	2,074,177	3/ 29,631,862

1/ Geographical area is a state, combination of states, subdivision of a state, and combination of a state and geographical subdivision of another state.

2/ Excludes North Slope reserves.

3/ Total API reserve.


MONT.
N. DAK.
S. DAK.
WYO.
NEBR.
CALIF.
NEV.
UTAH
COLO.
KAN.
MO.
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OHIO
MICH.
N.Y.
PA.
W. VA.
VA.
KY.
TENN.
ARIZ.
N. MEX.
OKLA.
ARK.
MISS.
ALA.
TEXAS
LA.
FLA.
ALASKA
N
LEGEND
API reserves
Dec.31,1969, million bbl.
Less than 20
20 to 100
100 to 400
400 to 1000
1,000 to 5,000
More than 5,000
0 100 200 300 400
Scale, miles

FIGURE 2.--Proved reserves of crude oil in the United States--December 31, 1969

TABLE 3. - Classification of 80 percent of the 1969 crude oil production by sulfur content in the United States

Geographical area[1/]	1969 production, 1,000 bbl					
	Sulfur content, percent					Total
	0.00-0.50	0.51-1.00	1.01-2.00	>2.00	Unassigned	
Alabama and Florida........	6,407	224	-	998	1,790	9,419
Alaska......................	74,036	[2/] 277	-	-	-	74,313
Arkansas...................	1,132	1,849	5,321	4,312	4,545	17,159
California						
Coastal..................	26,269	6,572	3,481	26,863	3,338	66,523
Los Angeles Basin........	102,643	12,352	40,268	9,429	52	164,744
San Joaquin..............	56,733	57,667	28,491	-	17	142,908
Colorado...................	7,904	12,494	3	141	7,344	27,886
Illinois...................	45,003	40	-	-	5,680	50,723
Indiana....................	3,548	28	-	-	4,248	7,824
Kansas and Missouri........	31,268	12,790	264	-	42,756	87,078
Kentucky and Tennessee.....	2,628	-	-	-	10,867	13,495
Louisiana						
North....................	24,568	3,835	513	-	15,056	43,972
South....................	475,827	24,263	-	-	182,907	682,997
Michigan...................	7,332	1,168	69	-	3,621	12,190
Mississippi................	6,758	3,707	1,362	10,550	41,036	63,413
Montana....................	23,091	9,088	8,106	703	3,255	44,243
Nebraska...................	4,132	4,032	-	-	3,916	12,080
New Mexico Southeast.......	33,336	13,886	21,311	21	45,165	113,719
New Mexico Northwest and Arizona.............	7,340	-	-	-	1,419	8,759
North Dakota...............	14,433	4,473	665	2,388	794	22,753
Ohio, New York, and Pennsylvania............	11,504	30	-	-	5,571	17,105
Oklahoma...................	120,162	42,649	211	-	52,252	215,274
Texas						
District 1...............	3,326	8,612	443	83	4,545	17,009
District 2...............	53,147	343	-	-	17,748	71,238
District 3...............	110,295	1,038	-	-	33,908	145,241
District 4...............	52,739	9	-	-	28,224	80,972
District 5...............	2,685	10,364	48	-	553	13,650
District 6...............	81,896	1,598	3,122	25,845	6,970	119,431
District 7B..............	16,617	-	-	-	21,325	37,942
District 7C..............	29,502	1,592	665	1,514	11,149	44,422
District 8...............	108,753	20,045	82,753	43,736	28,864	284,151
District 8A..............	77,448	12,683	70,205	31,822	15,408	207,567
District 9...............	15,641	6,394	-	-	34,850	56,885
District 10..............	24,299	-	-	-	4,338	28,637
Utah and Nevada............	20,798	326	1,928	-	742	23,794
West Virginia and Virginia.	3,106	-	-	-	-	3,106
Wyoming and South Dakota...	57,128	7,611	31,159	53,988	6,563	156,449
Total....................	1,743,434	282,039	300,389	212,393	650,816	3,189,071

1/ Geographical area is a state, combination of states, subdivision of a state, and combination of a state and geographical subdivision of another state.

2/ North Slope production.

Slope, (74 million barrels). The 1.01 to 2.00 percent sulfur content range had the next highest oil production of 300 million barrels. In this range, four geographical areas with 75 percent of the oil production were: Texas RRC district 8 (83 million barrels); Texas RRC district 8A (70 million barrels); California, Los Angeles Basin (40 million barrels); and Wyoming and South Dakota (31 million barrels). Of the remaining production, 282 million barrels was in the 0.51 to 1.00 percent sulfur content range, and 212 million barrels was in the greater than 2.00 percent range. The top seven geographical areas with 66 percent of the production in the 0.51 to 1.00 percent range were: California, San Joaquin (58 million barrels); Oklahoma (43 million barrels); Louisiana, south (24 million barrels); Texas RRC district 8 (20 million barrels); New Mexico, southeast (14 million barrels); Kansas and Missouri (13 million barrels); and Texas RRC district 8A (13 million barrels). Breakdown of 74 percent of the oil production in the greater than 2.00 percent range was: Wyoming and South Dakota (54 million barrels), Texas RRC district 8 (44 million barrels), Texas RRC district 8A (32 million barrels), and California, Coastal (27 million barrels).

Classification of Total 1969 Production

Based on the sulfur content assigned to 80 percent of the 1969 production, the remaining (20 percent) was apportioned to the four sulfur content ranges to establish the classification of the total 1969 production as shown in table 4. It was assumed that the result of assigning sulfur content by the above method would not vary appreciably from that had the actual sulfur content been known. Breakdown of the production

TABLE 4. - Classification of total 1969 crude oil production by sulfur content in the United States

Geographical area[1]	1969 production, 1,000 bbl				
	Sulfur content, percent				Total
	0.00-0.50	0.51-1.00	1.01-2.00	>2.00	
Alabama and Florida	7,910	277	-	1,232	9,419
Alaska	74,036	[2] 277	-	-	74,313
Arkansas	1,540	2,515	7,238	5,866	17,159
California					
Coastal	27,657	6,919	3,665	28,282	66,523
Los Angeles Basin	102,675	12,356	40,281	9,432	164,744
San Joaquin	56,740	57,674	28,494	-	142,908
Colorado	10,730	16,961	4	191	27,886
Illinois	50,678	45	-	-	50,723
Indiana	7,763	61	-	-	7,824
Kansas and Missouri	61,431	25,128	519	-	87,078
Kentucky and Tennessee	13,495	-	-	-	13,495
Louisiana					
North	37,360	5,832	780	-	43,972
South	649,860	33,137	-	-	682,997
Michigan	10,430	1,662	98	-	12,190
Mississippi	19,151	10,505	3,860	29,897	63,413
Montana	24,924	9,810	8,750	759	44,243
Nebraska	6,114	5,966	-	-	12,080
New Mexico Southeast	55,299	23,034	35,351	35	113,719
New Mexico Northwest and Arizona	8,759	-	-	-	8,759
North Dakota	14,955	4,635	689	2,474	22,753
Ohio, New York and Pennsylvania	17,061	44	-	-	17,105
Oklahoma	158,676	56,319	279	-	215,274
Texas					
District 1	4,539	11,752	605	113	17,009
District 2	70,781	457	-	-	71,238
District 3	143,887	1,354	-	-	145,241
District 4	80,958	14	-	-	80,972
District 5	2,798	10,802	50	-	13,650
District 6	86,971	1,697	3,316	27,447	119,431
District 7B	37,942	-	-	-	37,942
District 7C	39,388	2,125	888	2,021	44,422
District 8	121,050	22,311	92,109	48,681	284,151
District 8A	83,659	13,700	75,835	34,373	207,567
District 9	40,378	16,507	-	-	56,885
District 10	28,637	-	-	-	28,637
Utah and Nevada	21,467	337	1,990	-	23,794
West Virginia and Virginia	3,106	-	-	-	3,106
Wyoming and South Dakota	59,630	7,944	32,523	56,352	156,449
Total	2,242,435	362,157	337,324	247,155	3,189,071

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[1] Geographical area is a state, combination of states, subdivision of a state, and combination of a state and geographical subdivision of another state.

[2] North Slope production.

by sulfur content ranges was: 0 to 0.5 percent, 2,243 million barrels; 0.51 to 1.00 percent, 362 million barrels; 1.01 to 2.00 percent, 337 million barrels; and greater than 2.00 percent, 247 million barrels.

The classification of the total 1969 crude oil production and reserves as of December 31, 1969, in the United States is summarized in table 5.

TABLE 5. - Classification of total 1969 crude oil production and reserves as of December 31, 1969, by sulfur content in the United States

(Thousands of barrels)

Geographical area[1/]	Sulfur content, percent									
	0.00-0.50		0.51-1.00		1.01-2.00		>2.00		Total	
	Production	Reserve	Production	Reserve	Production	Reserve	Production	Reserve	Production	Reserve
Alabama and Florida	7,910	64,414	277	776	-	-	1,232	8,899	9,419	74,089
Alaska	74,036	432,300	[2/]277	-	-	-	-	-	74,313	[3/]432,300
Arkansas	1,540	9,573	2,515	6,533	7,238	94,869	5,866	16,371	17,159	127,346
California										
Coastal	27,657	13,484	6,919	263,624	3,665	26,800	28,282	345,264	66,523	649,172
Los Angeles Basin	102,675	11,647	12,356	65,287	40,281	1,486,820	9,432	76,766	164,744	1,640,520
San Joaquin	56,740	461,318	57,674	973,174	28,494	518,546	-	-	142,908	1,953,038
Colorado	10,730	144,230	16,961	253,409	4	57	191	2,908	27,886	400,604
Illinois	50,678	271,867	45	248	-	-	-	-	50,723	272,115
Indiana	7,763	41,153	61	154	-	-	-	-	7,824	41,307
Kansas and Missouri	61,431	394,613	25,128	170,517	519	1,620	-	-	87,078	566,750
Kentucky and Tennessee	13,495	73,230	-	-	-	-	-	-	13,495	73,230
Louisiana										
North	37,360	289,881	5,832	37,879	780	5,424	-	-	43,972	333,184
South	649,860	5,130,053	33,137	225,913	-	-	-	-	682,997	5,355,966
Michigan	10,430	43,933	1,662	7,168	98	416	-	-	12,190	51,517
Mississippi	19,151	83,484	10,505	72,026	3,860	21,301	29,897	183,387	63,413	360,198
Montana	24,924	152,645	9,810	64,278	8,750	53,969	759	4,873	44,243	275,765
Nebraska	6,114	20,551	5,966	26,284	-	-	-	-	12,080	46,835
New Mexico Southeast	55,299	423,099	23,034	160,787	35,351	222,163	35	248	113,719	806,297
New Mexico Northwest and Arizona	8,759	38,369	-	-	-	-	-	-	8,759	38,369
North Dakota	14,955	142,256	4,635	52,031	689	4,050	2,474	36,167	22,753	234,504
Ohio, New York, and Pennsylvania	17,061	193,516	44	382	-	-	-	-	17,105	193,898
Oklahoma	158,676	999,031	56,319	389,806	279	1,146	-	-	215,274	1,389,983
Texas										
District 1	4,539	40,146	11,752	112,260	605	3,717	113	1,041	17,009	157,164
District 2	70,781	881,063	457	5,420	-	-	-	-	71,238	886,483
District 3	143,887	1,821,646	1,354	12,782	-	-	-	-	145,241	1,834,428
District 4	80,958	563,768	14	97	-	-	-	-	80,972	563,865
District 5	2,798	12,403	10,802	121,967	50	496	-	-	13,650	134,866
District 6	86,971	2,190,955	1,697	15,830	3,316	34,748	27,447	348,749	119,431	2,590,282
District 7B	37,942	242,444	-	-	-	-	-	-	37,942	242,444
District 7C	39,388	306,463	2,125	17,002	838	5,690	2,021	19,198	44,422	348,353
District 8	121,050	839,825	22,311	151,364	92,109	1,759,582	48,681	357,811	284,151	3,108,582
District 8A	83,659	1,457,499	13,700	132,717	75,835	714,763	34,373	261,199	207,567	2,566,178
District 9	40,373	222,178	16,507	113,389	-	-	-	-	56,885	335,567
District 10	28,637	234,968	-	-	-	-	-	-	28,637	234,968
Utah and Nevada	21,467	187,368	337	3,637	1,990	5,182	-	-	23,794	196,137
West Virginia and Virginia	3,106	53,486	-	-	-	-	-	-	3,106	53,486
Wyoming and South Dakota	59,630	353,635	7,944	42,378	32,523	189,711	56,352	411,296	156,449	997,020
Total	2,242,435	18,907,496	362,157	3,499,119	337,324	5,151,070	247,135	2,074,177	3,189,071	[4/]29,631,862

1/ Geographical area is a state, combination of states, subdivision of a state, and combination of state and geographical subdivision of another state.
2/ North Slope production.
3/ Excludes North Slope reserves.
4/ Total API reserves.

SULFUR CONTENT OF OIL BY GEOGRAPHICAL AREAS

Of the 31 States with oil production during 1969, four were subdivided into a total of 19 areas, and nine were combined with other States or subdivisions resulting in a total of 37 geographical areas (fig. 3). Due to a limited discussion in this report, data sheets of each geographical area are included as additional information. This information pertains to each area's contribution to the U.S. production and reserve status, production and reserve trends, and production and reserve by sulfur content, the latter based on selected field data.

Alabama and Florida

1. 1969 production of 9,419,000 bbl was 0.30 percent of U.S. production. Alabama 7,685,000 bbl. Florida 1,734,000 bbl.

2. Reserve of about 74,089,000 bbl as of December 31, 1969 was 0.25 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Alabama's annual crude oil production peaked in 1963 at 9,175,000 bbl.*

   B. After 1945 Alabama's annual crude oil reserve peaked in 1966 at 85,344,000 bbl.*

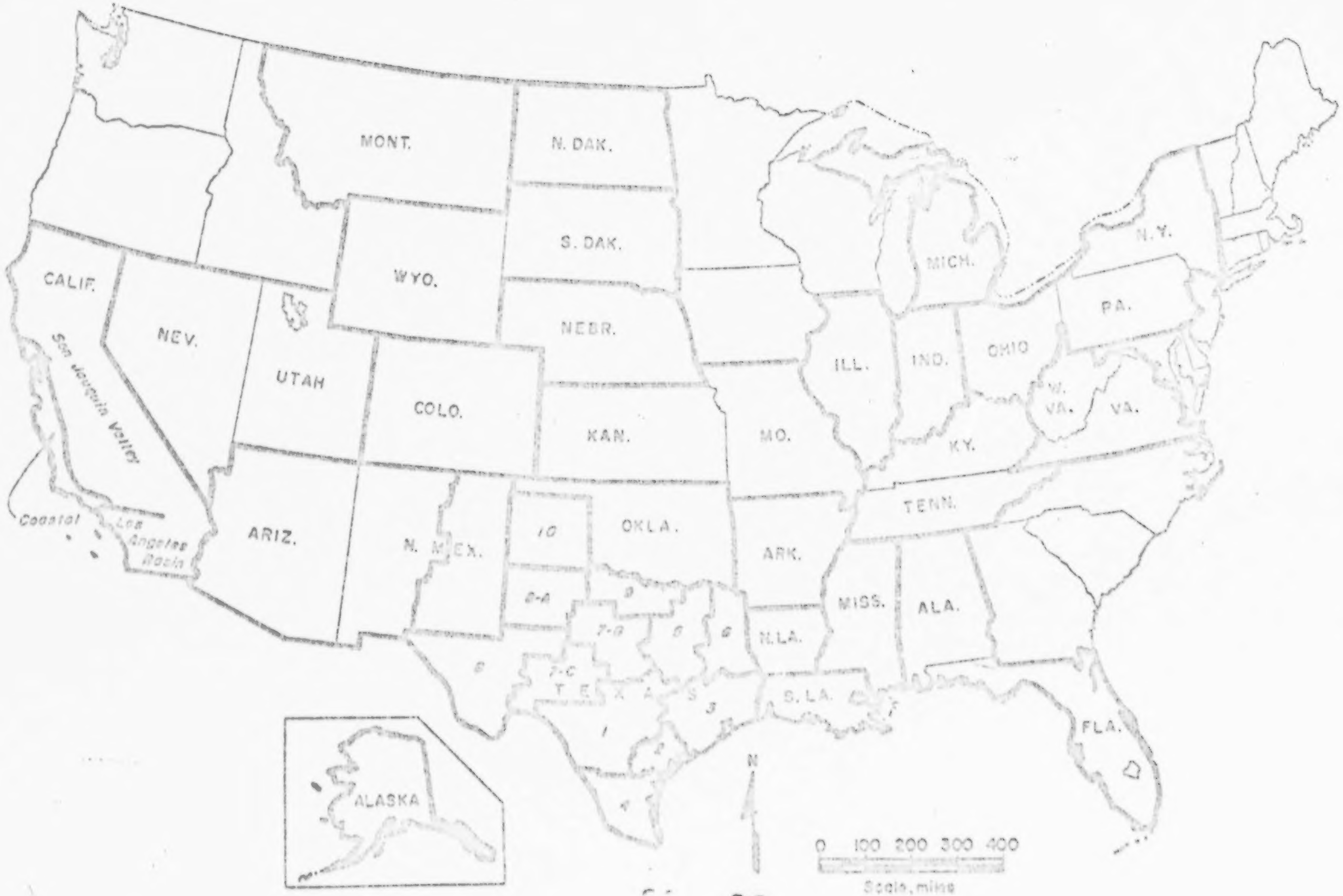
4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 6

   B. Percent of 1969 production with assigned sulfur content: 83.3

   C. Percent of 1969 reserve with assigned sulfur content: 90.5

*Florida information not available.


MONT.
N. DAK.
S. DAK.
WYO.
NEBR.
CALIF.
NEV.
UTAH
COLO.
KAN.
San Joaquin Valley
Coastal
Los Angeles Basin
ARIZ.
N. MEX.
10
OKLA.
8-A
9
7-B
5
6
8
7-C
TEXAS
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ALA.
N. LA.
S. LA.
FLA.
N
0 100 200 300 400
Scale, miles

FIGURE 3.--Thirty-seven geographical areas producing oil in the United States--1969

Alaska

1. 1969 production of 74,313,000 bbl was 2.33 percent of U.S. production.

2. Reserve of about 432,300,000 bbl* as of December 31, 1969 was 1.46 percent of U.S. reserve (API).**

3. Production and reserve trends (API):

   A. After 1945 Alaska's annual crude oil production has not established a peak.

   B. After 1945 Alaska's annual crude oil reserve has not established a peak.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 5

   B. Percent of 1969 production with assigned sulfur content: 100.0

   C. Percent of 1969 reserve with assigned sulfur content: 100.0

* Excludes North Slope reserves.
** Reserve was 10,148,824,000 bbl as of December 31, 1970, including North Slope.

Arkansas

1. 1969 production of 17,159,000 bbl was 0.54 percent of U.S. production.

2. Reserve of about 127,346,000 bbl as of December 31, 1969 was 0.43 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Arkansas' annual crude oil production peaked in 1948 at 31,056,000 bbl.

   B. After 1945 Arkansas' annual crude oil reserve peaked in 1953 at 358,231,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 36

   B. Percent of 1969 production with assigned sulfur content: 67.0

   C. Percent of 1969 reserve with assigned sulfur content: 65.3

California

1. 1969 production of 374,175,000 bbl was 11.74 percent of U.S. production.

2. Reserve of about 4,242,730,000 bbl as of December 31, 1969 was 14.32 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 California's annual crude oil production peaked in 1968 at 375,730,000 bbl.

   B. After 1945 California's annual crude oil reserve peaked in 1966 at 4,607,951,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 72

   B. Percent of 1969 production with assigned sulfur content: 65.6

   C. Percent of 1969 reserve with assigned sulfur content: 72.0

California, Coastal

1. 1969 production of 66,523,000 bbl was 2.09 percent of U.S. production.

2. Reserve of about 649,172,000 bbl as of December 31, 1969 was 2.19 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 California Coastal's annual crude oil production peaked in 1953 at 93,942,000 bbl.

   B. After 1945 California Coastal's annual crude oil reserve peaked in 1954 at 853,983,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 10

   B. Percent of 1969 production with assigned sulfur content: 41.2

   C. Percent of 1969 reserve with assigned sulfur content: 33.9

California, Los Angeles Basin

1. 1969 production of 164,744,000 bbl was 5.17 percent of U.S. production.

2. Reserve of about 1,640,520,000 bbl as of December 31, 1969 was 5.54 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 California, Los Angeles Basin's annual crude oil production has not established a peak.

   B. After 1945 California, Los Angeles Basin's annual crude oil reserve peaked in 1966 at 1,921,282,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 31

   B. Percent of 1969 production with assigned sulfur content: 68.0

   C. Percent of 1969 reserve with assigned sulfur content: 84.3

California, San Joaquin

1. 1969 production of 142,908,000 bbl was 4.48 percent of U.S. production.

2. Reserve of about 1,953,038,000 bbl as of December 31, 1969 was 6.59 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 California, San Joaquin's annual crude oil production peaked in 1948 at 157,693,000 bbl.

   B. After 1945 California, San Joaquin's annual crude oil reserve peaked in 1958 at 2,116,491,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 31

   B. Percent of 1969 production with assigned sulfur content: 74.3

   C. Percent of 1969 reserve with assigned sulfur content: 74.3

Colorado

1. 1969 production of 27,886,000 bbl was 0.87 percent of U.S. production.

2. Reserve of about 400,604,000 bbl as of December 31, 1969 was 1.35 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Colorado's annual crude oil production peaked in 1956 at 58,516,000 bbl.

   B. After 1945 Colorado's annual crude oil reserve peaked in 1968 at 420,473,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 4

   B. Percent of 1969 production with assigned sulfur content: 51.3

   C. Percent of 1969 reserve with assigned sulfur content: 51.0

Illinois

1. 1969 production of 50,723,000 bbl was 1.59 percent of U.S. production.

2. Reserve of about 272,115,000 bbl as of December 31, 1969 was 0.92 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Illinois' annual crude oil production peaked in 1956 at 82,314,000 bbl.

   B. After 1945 Illinois' annual crude oil reserve peaked in 1956 at 700,000,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 29

   B. Percent of 1969 production with assigned sulfur content: 80.0

   C. Percent of 1969 reserve with assigned sulfur content: 80.5

Indiana

1. 1969 production of 7,824,000 bbl was 0.25 percent of U.S. production.

2. Reserve of about 41,307,000 bbl as of December 31, 1969 was 0.14 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Indiana's annual crude oil production peaked in 1953 at 12,641,000 bbl.

   B. After 1945 Indiana's annual crude oil reserve peaked in 1959 at 73,951,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 8

   B. Percent of 1969 production with assigned sulfur content: 44.5

   C. Percent of 1969 reserve with assigned sulfur content: 45.8

Kansas and Missouri

1. 1969 production of 87,078,000 bbl was 2.73 percent of U.S. production. Kansas 87,011,000 bbl. Missouri 67,000 bbl.

2. Reserve of about 566,750,000 bbl as of December 31, 1969 was 1.91 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Kansas' annual crude oil production peaked in 1956 at 124,473,000 bbl.*

   B. After 1945 Kansas' annual crude oil reserve peaked in 1955 at 998,068,000 bbl.*

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 44*

   B. Percent of 1969 production with assigned sulfur content: 33.1

   C. Percent of 1969 reserve with assigned sulfur content: 32.7

*Missouri information not available.

Kentucky and Tennessee

1. 1969 production of 13,495,000 bbl was 0.42 percent of U.S. production. Kentucky 13,463,000 bbl. Tennessee 32,000 bbl.

2. Reserve of about 73,230,000 bbl as of December 31, 1969 was 0.25 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Kentucky's annual crude oil production peaked in 1959 at 27,272,000 bbl.*

   B. After 1945 Kentucky's annual crude oil reserve peaked in 1956 at 148,442,000 bbl.*

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 8*

   B. Percent of 1969 production with assigned sulfur content: 17.9

   C. Percent of 1969 reserve with assigned sulfur content: 16.0

*Tennessee information not available.

Louisiana

1. 1969 production of 726,969,000 bbl was 22.78 percent of U.S. production.

2. Reserve of about 5,689,150,000 bbl as of December 31, 1969 was 19.20 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Louisiana's annual crude oil production has not established a peak.

   B. After 1945 Louisiana's annual crude oil reserve has not established a peak.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 95

   B. Percent of 1969 production with assigned sulfur content: 48.3

   C. Percent of 1969 reserve with assigned sulfur content: 50.7

Louisiana, North

1. 1969 production of 43,972,000 bbl was 1.38 percent of U.S. production.

2. Reserve of about 333,184,000 bbl as of December 31, 1969 was 1.12 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Louisiana, North's annual crude oil production peaked in 1965 at 51,904,000 bbl.

   B. After 1945 Louisiana, North's annual crude oil reserve peaked in 1956 at 464,745,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 11

   B. Percent of 1969 production with assigned sulfur content: 43.6

   C. Percent of 1969 reserve with assigned sulfur content: 45.4

Louisiana, South

1. 1969 production of 682,997,000 bbl was 21.40 percent of U.S. production.

2. Reserve of about 5,355,966,000 bbl as of December 31, 1969 was 18.08 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Louisiana, South's annual crude oil production has not established a peak.

   B. After 1945 Louisiana, South's annual crude oil reserve has not established a peak.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 84

   B. Percent of 1969 production with assigned sulfur content: 48.6

   C. Percent of 1969 reserve with assigned sulfur content: 51.0

Michigan

1. 1969 production of 12,190,000 bbl was 0.38 percent of U.S. production.

2. Reserve of about 51,517,000 bbl as of December 31, 1969 was 0.17 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Michigan's annual crude oil production peaked in 1961 at 18,901,000 bbl.

   B. After 1945 Michigan's annual crude oil reserve peaked in 1961 at 78,790,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 13

   B. Percent of 1969 production with assigned sulfur content: 63.2

   C. Percent of 1969 reserve with assigned sulfur content: 63.8

Mississippi

1. 1969 production of 63,413,000 bbl was 1.99 percent of U.S. production.

2. Reserve of about 360,198,000 bbl as of December 31, 1969 was 1.22 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Mississippi's annual crude oil production has not established a peak.

   B. After 1945 Mississippi's annual crude oil reserve peaked in 1954 at 412,276,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 22

   B. Percent of 1969 production with assigned sulfur content: 33.9

   C. Percent of 1969 reserve with assigned sulfur content: 33.8

Montana

1. 1969 production of 44,243,000 bbl was 1.39 percent of U.S. production.

2. Reserve of about 275,765,000 bbl as of December 31, 1969 was 0.93 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Montana's annual crude oil production peaked in 1968 at 48,460,000 bbl.

   B. After 1945 Montana's annual crude oil reserve peaked in 1968 at 345,117,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 38

   B. Percent of 1969 production with assigned sulfur content: 91.0

   C. Percent of 1969 reserve with assigned sulfur content: 87.6

Nebraska

1. 1969 production of 12,080,000 bbl was 0.38 percent of U.S. production.

2. Reserve of about 46,835,000 bbl as of December 31, 1969 was 0.16 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Nebraska's annual crude oil production peaked in 1962 at 25,195,000 bbl.

   B. After 1945 Nebraska's annual crude oil reserve peaked in 1961 at 100,429,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 20

   B. Percent of 1969 production with assigned sulfur content: 56.9

   C. Percent of 1969 reserve with assigned sulfur content: 57.2

New Mexico

1. 1969 production of 120,061,000 bbl was 3.77 percent of U.S. production.

2. Reserve of about 839,927,000 bbl as of December 31, 1969 was 2.84 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 New Mexico's annual crude oil production peaked in 1968 at 120,982,000 bbl.

   B. After 1945 New Mexico's annual crude oil reserve peaked in 1961 at 1,090,203,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 39

   B. Percent of 1969 production with assigned sulfur content: 57.3

   C. Percent of 1969 reserve with assigned sulfur content: 56.6

New Mexico, Northwest and Arizona

1. 1969 production of 8,759,000 bbl was 0.27 percent of U.S. production. New Mexico, Northwest 6,341,000 bbl. Arizona 2,418,000 bbl.

2. Reserve of about 38,369,000 bbl as of December 31, 1969 was 0.13 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 New Mexico, Northwest's annual crude oil production peaked in 1961 at 14,211,000 bbl.*

   B. After 1945 New Mexico, Northwest's annual crude oil reserve peaked in 1961 at 75,080,000 bbl.*

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 4

   B. Percent of 1969 production with assigned sulfur content: 46.9

   C. Percent of 1969 reserve with assigned sulfur content: 46.9

*Arizona information not available.

New Mexico, Southeast

1. 1969 production of 113,719,000 bbl was 3.57 percent of U.S. production.

2. Reserve of about 811,297,000 bbl as of December 31, 1969 was 2.74 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 New Mexico, Southeast's annual crude oil production has not established a peak.

   B. After 1945 New Mexico, Southeast's annual crude oil reserve peaked in 1961 at 1,015,123,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 36

   B. Percent of 1969 production with assigned sulfur content: 58.9

   C. Percent of 1969 reserve with assigned sulfur content: 57.5

North Dakota

1. 1969 production of 22,753,000 bbl was 0.71 percent of U.S. production.

2. Reserve of about 234,504,000 bbl as of December 31, 1969 was 0.79 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 North Dakota's crude oil production peaked in 1966 at 27,126,000 bbl.

   B. After 1945 North Dakota's crude oil reserve peaked in 1960 at 430,521,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 31

   B. Percent of 1969 production with assigned sulfur content: 89.2

   C. Percent of 1969 reserve with assigned sulfur content: 88.9

Ohio, New York, and Pennsylvania

1. 1969 production of 17,105,000 bbl was 0.54 percent of U.S. production. Ohio 10,971,000 bbl. New York 1,256,000 bbl. Pennsylvania 4,878,000 bbl.

2. Reserve of about 193,898,000 bbl as of December 31, 1969 was 0.66 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 these three States' annual crude oil production peaked in 1964 at 22,836,000 bbl.

   B. After 1945 these three States' annual crude oil reserve peaked in 1956 at 238,471,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 3*

   B. Percent of 1969 production with assigned sulfur content: 67.4

   C. Percent of 1969 reserve with assigned sulfur content: 57.9

*Excludes Ohio because sulfur samples refer to crude oil grades and not fields.

Oklahoma

1. 1969 production of 215,274,000 bbl was 6.75 percent of U.S. production.

2. Reserve of about 1,389,983,000 bbl as of December 31, 1969 was 4.69 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Oklahoma's annual crude oil production peaked in 1967 at 221,278,000 bbl.

   B. After 1945 Oklahoma's annual crude oil reserve peaked in 1955 at 2,016,045,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 30

   B. Percent of 1969 production with assigned sulfur content: 61.0

   C. Percent of 1969 reserve with assigned sulfur content: 62.4

Texas

1. 1969 production of 1,107,144,000 bbl was 34.71 percent of U.S. production.

2. Reserve of about 13,063,182,000 bbl as of December 31, 1969 was 44.08 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Texas' annual crude oil production has not established a peak.

   B. After 1945 Texas' annual crude oil reserve peaked in 1951 at 15,314,964,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 381

   B. Percent of 1969 production with assigned sulfur content: 57.6

   C. Percent of 1969 reserve with assigned sulfur content: 71.5

Texas, District 1

1. 1969 production of 17,009,000 bbl was 0.53 percent of U.S. production.

2. Reserve of about 157,166,000 bbl as of December 31, 1969 was 0.53 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Texas, District 1's annual crude oil production peaked in 1956 at 20,104,000 bbl.

   B. After 1945 Texas, District 1's annual crude oil reserve peaked in 1967 at 159,435,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 15

   B. Percent of 1969 production with assigned sulfur content: 62.6

   C. Percent of 1969 reserve with assigned sulfur content: 64.0

Texas, District 2

1. 1969 production of 71,238,000 bbl was 2.23 percent of U.S. production.

2. Reserve of about 886,483,000 bbl as of December 31, 1969 was 2.99 percent of U.S. reserve (API).

3. Production and reserve trends (API):

    A. After 1945 Texas, District 2's annual crude oil production has not established a peak.

    B. After 1945 Texas, District 2's annual crude oil reserve peaked in 1961 at 1,008,953,000 bbl.

4. Crude oil analysis:

    A. Number of fields (or reservoirs) with assigned sulfur content: 68

    B. Percent of 1969 production with assigned sulfur content: 72.4

    C. Percent of 1969 reserve with assigned sulfur content: 76.7

Texas, District 3

1. 1969 production of 145,241,000 bbl was 4.55 percent of U.S. production.

2. Reserve of about 1,834,428,000 bbl as of December 31, 1969 was 6.19 percent of U.S. reserve (API).

3. Production and reserve trends (API):

    A. After 1945 Texas, District 3's annual crude oil production peaked in 1948 at 182,610,000 bbl.

    B. After 1945 Texas, District 3's annual crude oil reserve peaked in 1948 at 2,557,022,000 bbl.

4. Crude oil analysis:

    A. Number of fields (or reservoirs) with assigned sulfur content: 43

    B. Percent of 1969 production with assigned sulfur content: 48.4

    C. Percent of 1969 reserve with assigned sulfur content: 50.2

Texas, District 4

1. 1969 production of 80,972,000 bbl was 2.54 percent of U.S. production.

2. Reserve of about 563,865,000 bbl as of December 31, 1969 was 1.90 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Texas, District 4's annual crude oil production peaked in 1953 at 92,946,000 bbl.

   B. After 1945 Texas, District 4's annual crude oil reserve peaked in 1952 at 1,356,161,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 37

   B. Percent of 1969 production with assigned sulfur content: 50.3

   C. Percent of 1969 reserve with assigned sulfur content: 53.2

Texas, District 5

1. 1969 production of 13,650,000 bbl was 0.43 percent of U.S. production.

2. Reserve of about 134,866,000 bbl as of December 31, 1969 was 0.46 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Texas, District 5's annual crude oil production peaked in 1951 at 18,993,000 bbl.

   B. After 1945 Texas, District 5's annual crude oil reserve was a maximum 295,967,000 bbl in 1946.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 12

   B. Percent of 1969 production with assigned sulfur content: 91.7

   C. Percent of 1969 reserve with assigned sulfur content: 97.2

Texas, District 6

1. 1969 production of 119,431,000 bbl was 3.75 percent of U.S. production.

2. Reserve of about 2,590,282,000 bbl as of December 31, 1969 was 8.74 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Texas, District 6's annual crude oil production peaked in 1947 at 158,547,000 bbl.

   B. After 1945 Texas, District 6's annual crude oil reserve peaked in 1952 at 3,507,817,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 10

   B. Percent of 1969 production with assigned sulfur content: 83.0

   C. Percent of 1969 reserve with assigned sulfur content: 92.9

Texas, District 7B

1. 1969 production of 37,942,000 bbl was 1.19 percent of U.S. production.

2. Reserve of about 242,444,000 bbl as of December 31, 1969 was 0.82 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Texas, District 7B's annual crude oil production peaked in 1956 at 58,285,000 bbl.

   B. After 1945 Texas, District 7B's annual crude oil reserve peaked in 1957 at 307,207,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 43

   B. Percent of 1969 production with assigned sulfur content: 40.3

   C. Percent of 1969 reserve with assigned sulfur content: 45.5

Texas, District 7C

1. 1969 production of 44,422,000 bbl was 1.39 percent of U.S. production.

2. Reserve of about 348,353,000 bbl as of December 31, 1969 was 1.18 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Texas, District 7C's annual crude oil production peaked in 1955 at 64,103,000 bbl.

   B. After 1945 Texas, District 7C's annual crude oil reserve peaked in 1951 at 725,498,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 30

   B. Percent of 1969 production with assigned sulfur content: 60.5

   C. Percent of 1969 reserve with assigned sulfur content: 57.2

Texas, District 8

1. 1969 production of 284,151,000 bbl was 8.91 percent of U.S. production.

2. Reserve of about 3,168,582,000 bbl as of December 31, 1969 was 10.69 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Texas, District 8's annual crude oil production peaked in 1967 at 286,081,000 bbl.

   B. After 1945 Texas, District 8's annual crude oil reserve peaked in 1967 at 3,629,496,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 38

   B. Percent of 1969 production with assigned sulfur content: 52.0

   C. Percent of 1969 reserve with assigned sulfur content: 67.2

Texas, District 8A

1. 1969 production of 207,567,000 bbl was 6.51 percent of U.S. production.

2. Reserve of about 2,566,178,000 bbl as of December 31, 1969 was 8.66 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Texas, District 8A's annual crude oil production has not established a peak.

   B. After 1945 Texas, District 8A's annual crude oil reserve peaked in 1965 at 2,750,807,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 17

   B. Percent of 1969 production with assigned sulfur content: 70.0

   C. Percent of 1969 reserve with assigned sulfur content: 81.8

Texas, District 9

1. 1969 production of 56,885,000 bbl was 1.78 percent of U.S. production.

2. Reserve of about 335,567,000 bbl as of December 31, 1969 was 1.13 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Texas, District 9's annual crude oil production peaked in 1956 at 77,148,000 bbl.

   B. After 1945 Texas, District 9's annual crude oil reserve peaked in 1954 at 544,782,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 51

   B. Percent of 1969 production with assigned sulfur content: 36.1

   C. Percent of 1969 reserve with assigned sulfur content: 41.8

Texas, District 10

1. 1969 production of 28,637,000 bbl was 0.90 percent of U.S. production.

2. Reserve of about 234,968,000 bbl as of December 31, 1969 was 0.79 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Texas, District 10's annual crude oil production peaked in 1959 at 39,170,000 bbl.

   B. After 1945 Texas, District 10's annual crude oil reserve peaked in 1955 at 362,264,000 bbl.

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 17

   B. Percent of 1969 production with assigned sulfur content: 72.1

   C. Percent of 1969 reserve with assigned sulfur content: 73.5

Utah and Nevada

1. 1969 production of 23,794,000 bbl was 0.75 percent of U.S. production. Utah 23,571,000 bbl. Nevada 223,000 bbl.

2. Reserve of about 196,187,000 bbl as of December 31, 1969 was 0.66 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Utah's annual crude oil production peaked in 1959 at 39,847,000 bbl.*

   B. After 1945 Utah's annual crude oil reserve peaked in 1963 at 219,576,000 bbl.*

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 10*

   B. Percent of 1969 production with assigned sulfur content: 90.8

   C. Percent of 1969 reserve with assigned sulfur content: 90.1

*Nevada information not available.

West Virginia and Virginia

1. 1969 production of 3,106,000 bbl was 0.10 percent of U.S. production. West Virginia 3,105,000 bbl. Virginia 1,000 bbl.

2. Reserve of about 53,486,000 bbl as of December 31, 1969 was 0.18 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 West Virginia's annual crude oil production peaked in 1966 at 3,677,000 bbl.*

   B. After 1945 West Virginia's annual crude oil reserve peaked in 1964 at 58,710,000 bbl.*

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 1

   B. Percent of 1969 production with assigned sulfur content: 100.0

   C. Percent of 1969 reserve with assigned sulfur content: 100.0

*Virginia information not available.

Wyoming and South Dakota

1. 1969 production of 156,449,000 bbl was 4.91 percent of U.S. production. Wyoming 156,291,000 bbl. South Dakota 158,000 bbl.

2. Reserve of about 997,020,000 bbl as of December 31, 1969 was 3.36 percent of U.S. reserve (API).

3. Production and reserve trends (API):

   A. After 1945 Wyoming's annual crude oil production has not established a peak.*

   B. After 1945 Wyoming's annual crude oil reserve peaked in 1960 at 1,427,375,000 bbl.*

4. Crude oil analysis:

   A. Number of fields (or reservoirs) with assigned sulfur content: 124

   B. Percent of 1969 production with assigned sulfur content: 92.6

   C. Percent of 1969 reserve with assigned sulfur content: 95.7

*South Dakota information not available.

CHAPTER 2.--REFINERIES AND BULK TERMINALS

LOCATION AND CAPACITIES

The 281 refineries which manufactured the multitude of products required to meet the United States demand in 1969 were located in 39 States; however, most of the capacity was concentrated in three States. Texas, California, and Louisiana had 103 refineries and accounted for 52 percent of the U.S. refinery capacity and 18 States had 92 percent of the total capacity, figure 4. Changes in the number or capacities of refineries has been of small magnitude in recent years; capacity increased 2.9 percent in 1969 while the number of refineries decreased by three.

The basic operation in today's refineries is distillation and refinery capacities are expressed in terms of crude oil throughput for this process. Capacities of refineries represent the maximum daily average crude oil throughput of a plant in complete operation. It approximates the maximum daily average crude oil throughput or "runs to stills," that can be maintained for an extended period with allowance for necessary "downtime." Capacity figures may be expressed in barrels per calendar day or in barrels per stream day. The former implies a prorated allowance for regular "downtime" for routine maintenance and repair. The latter refers to the throughput of a unit operating for a full day (24 hours) with no allowance for "downtime." In this report all capacity figures are expressed in barrels per calendar day, unless otherwise stated.

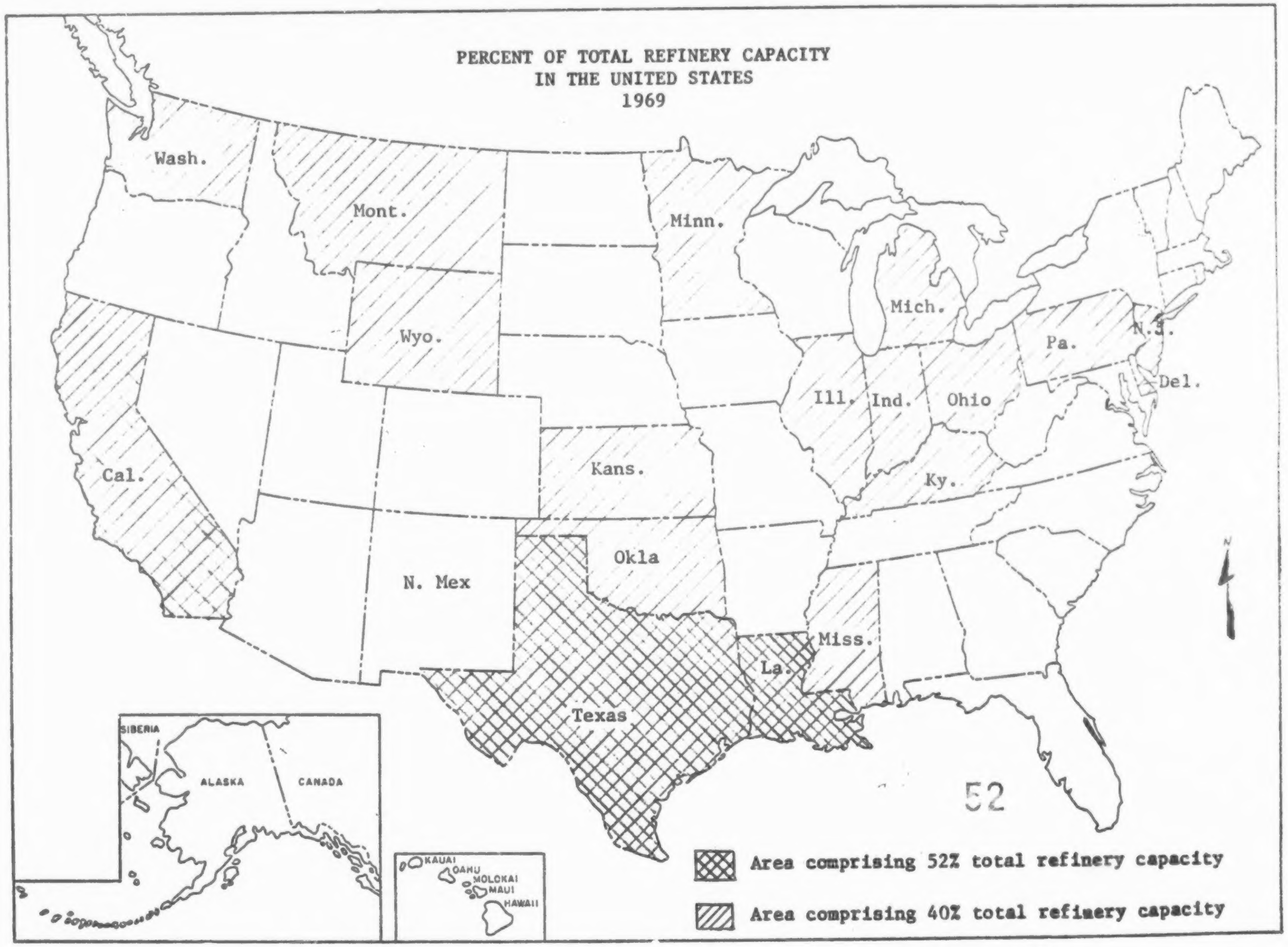

PERCENT OF TOTAL REFINERY CAPACITY
IN THE UNITED STATES
1969
Wash.
Mont.
Minn.
Mich.
Wyo.
Pa.
N.J.
Del.
Ill.
Ind.
Ohio
Cal.
Kans.
Ky.
Okla
N. Mex
Miss.
La.
Texas
SIBERIA
ALASKA
CANADA
KAUAI
OAHU
MOLOKAI
MAUI
HAWAII
▩ Area comprising 52% total refinery capacity
▨ Area comprising 40% total refinery capacity

FIGURE 4.--Percent of total refinery capacity in the United States--1969

Statistical information relating to capacity of refineries is usually compiled as of January 1 of each year and is described as operating or shutdown as of that date. In this discussion only operating capacity will be used. Shutdown capacity accounts for a small part of the total. On January 1, 1969, it accounted for 1.4 percent and on January 1, 1970, for 1.6 percent of the total.

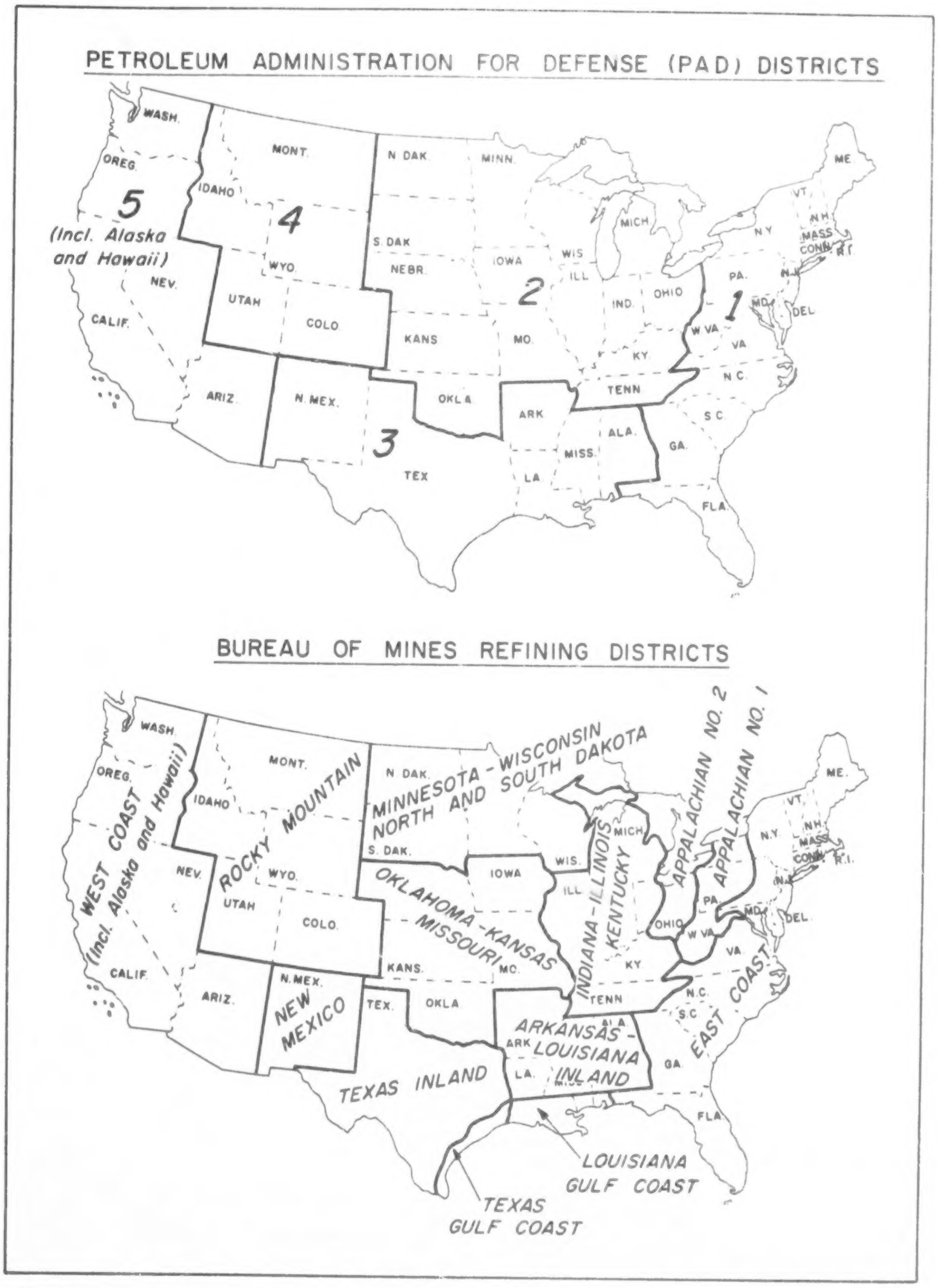
On January 1, 1969, there were 264 operating refineries with a total operating capacity of 11,575,829 barrels per day while on January 1, 1970, there were 262 refineries with a total capacity of 11,882,393 barrels per day, table 6. The geographic distribution of operating refining capacity as of January 1, 1970, shows that Texas leads all other States with 27 percent of the total followed by California with 14 percent and Louisiana with 11 percent. P.A.D. District III, figure 5, accounts for 41 percent of the total while P.A.D. District II has 27 percent. At the refinery district level, the Texas Gulf district has 24 percent followed by Indiana-Illinois and West Coast districts, each with about 16 percent.

Increased capacity of down-stream processes, i.e., cracking, reforming, coking, and alkylation, in refinery operations has reduced the quantities of distillate and particularly residual fuel oil manufactured. At the beginning of 1969, operating capacity, expressed in terms of gasoline output, of these down-stream processes totaled 5,456,754 barrels per day compared with 5,729,279 barrels per day at the end of the year, an increase of 5 percent. The geographic distribution of the capacities of these down-stream facilities follows closely that shown for crude-oil capacity. About 3,876,531 barrels per calendar day of the total capacity

TABLE 6. - Number and capacity of petroleum refineries in the United States by P.A.D. Districts and States: January 1, 1970

Refining District, P.A.D. District and State	Petroleum refineries (Number)			Crude oil distillation[1]				Cracking, reforming, coking, and alkylation			
				Crude oil throughput capacity (Barrels per calendar day)				Gasoline output capacity[2] (Barrels per calendar day)			
	Total	Operating	Shutdown	Operating	Shutdown		Total	Operating	Shutdown		Total
					Operable	Inoperable			Operable	Inoperable	
District I:											
Delaware	1	1	-	140,000	-	-	140,000	67,100	-	-	67,100
Florida	1	1	-	3,000	-	-	3,000	-	-	-	-
Georgia	2	2	-	8,900	-	-	8,900	-	-	-	-
Maryland	2	2	-	19,000	-	-	19,000	-	-	-	-
New Jersey	7	6	1	510,300	-	20,000	530,300	219,450	-	-	219,450
New York	2	2	-	87,000	-	-	87,000	34,300	-	-	34,300
Pennsylvania	13	13	-	637,120	16,000	-	653,120	351,638	12,000	1,530	365,168
Rhode Island	1	1	-	7,500	-	-	7,500	-	-	-	-
Virginia	1	1	-	51,400	-	-	51,400	45,030	-	-	45,030
West Virginia	2	2	-	9,000	-	-	9,000	2,650	-	-	2,650
Total	32	31	1	1,473,220	16,000	20,000	1,509,220	720,168	12,000	1,530	733,698
District II:											
Illinois	12	11	1	709,370	6,330	-	715,700	331,910	3,500	-	335,410
Indiana	11	9	2	586,000	10,000	1,500	597,500	220,410	-	-	220,410
Kansas	12	12	-	402,643	-	-	402,643	191,287	-	1,250	192,537
Kentucky	4	4	-	142,000	-	-	142,000	56,200	-	-	56,200
Michigan	10	7	3	149,518	11,500	17,250	178,268	68,988	1,500	8,000	78,488
Minnesota	3	3	-	138,300	-	-	138,300	60,500	-	-	60,500
Missouri	1	1	-	83,000	-	-	83,000	36,000	-	-	36,000
Nebraska	1	1	-	5,000	-	-	5,000	2,200	-	-	2,200
North Dakota	2	2	-	53,000	2,000	-	55,000	19,820	1,400	-	21,220
Ohio	9	7	2	445,100	22,500	-	467,600	276,832	7,860	-	284,692
Oklahoma	15	14	1	455,100	900	-	456,000	221,950	900	-	222,850
Tennessee	1	1	-	28,500	-	-	28,500	7,700	-	-	7,700
Wisconsin	2	1	1	29,000	5,000	-	34,000	9,900	-	500	10,400
Total	83	73	10	3,226,531	58,230	18,750	3,303,511	1,503,697	15,160	9,750	1,528,607
District III:											
Alabama	6	5	1	27,700	6,500	-	34,200	-	-	-	-
Arkansas	6	6	-	91,000	-	-	91,000	38,400	-	-	38,400
Louisiana	17	17	-	1,257,400	1,000	-	1,258,400	638,479	-	-	638,479
Mississippi	5	5	-	172,500	-	-	172,500	100,900	-	-	100,900
New Mexico	6	5	1	41,840	1,000	-	42,840	17,400	-	-	17,400
Texas	51	48	3	3,235,342	32,900	14,300	3,282,542	1,533,065	6,150	13,530	1,552,745
Total	91	86	5	4,825,782	41,400	14,300	4,881,482	2,328,244	6,150	13,530	2,347,924
District IV:											
Colorado	5	4	1	44,700	5,000	-	49,700	17,250	1,750	-	19,000
Montana	10	9	1	125,110	4,750	-	129,860	61,030	6,110	600	67,740
Utah	5	5	-	114,900	-	-	114,900	49,300	-	-	49,300
Wyoming	10	9	1	136,900	10,000	-	146,900	61,630	-	-	61,630
Total	30	27	3	421,610	19,750	-	441,360	189,210	7,860	600	197,670
District V:											
Alaska	2	2	-	37,000	-	-	37,000	-	-	-	-
Arizona	-	-	-	-	-	-	-	-	-	-	-
California	35	35	-	1,631,050	3,500	-	1,634,550	891,480	5,900	16,095	913,475
Hawaii	1	1	-	35,000	-	-	35,000	11,680	-	-	11,680
Nevada	1	1	-	800	-	-	800	-	-	-	-
Oregon	1	1	-	12,000	-	-	12,000	-	-	-	-
Washington	5	5	-	219,400	-	-	219,400	84,800	-	-	84,800
Total	45	45	-	1,935,250	3,500	-	1,938,750	987,960	5,900	16,095	1,009,955
United States, total	281	262	19	11,882,393	138,880	53,050	12,074,323	5,729,279	47,070	41,505	5,817,854

[1] Includes a small amount of crude oil charged directly to cracking units.
[2] Capacity expressed in terms of gasoline production.


PETROLEUM ADMINISTRATION FOR DEFENSE (PAD) DISTRICTS

BUREAU OF MINES REFINING DISTRICTS

5
(Incl. Alaska and Hawaii)
4
3
2
1
WASH.
OREG.
CALIF.
NEV.
IDAHO
MONT.
WYO.
UTAH
COLO.
ARIZ.
N. MEX.
N. DAK.
S. DAK.
NEBR.
KANS.
OKLA.
TEX.
MINN.
IOWA
MO.
ARK.
LA.
WIS.
ILL.
MICH.
IND.
OHIO
KY.
TENN.
MISS.
ALA.
GA.
FLA.
S.C.
N.C.
VA.
W. VA.
PA.
N.Y.
ME.
VT.
N.H.
MASS.
CONN.
R.I.
N.J.
DEL.
MD.
WEST COAST (Incl. Alaska and Hawaii)
ROCKY MOUNTAIN
NEW MEXICO
MINNESOTA-WISCONSIN NORTH AND SOUTH DAKOTA
OKLAHOMA-KANSAS-MISSOURI
INDIANA-ILLINOIS KENTUCKY
APPALACHIAN NO. 2
APPALACHIAN NO. 1
EAST COAST
TEXAS INLAND
ARKANSAS-LOUISIANA INLAND
LOUISIANA GULF COAST
TEXAS GULF COAST

FIGURE 5. - Petroleum administration for defense (PAD) and refinery districts

was in P.A.D. Districts II and III, table 6. Reduction of residual oil output in the past few years has been the result of refiners using residual oils to obtain higher valued fractions from cracking and reforming processes.

Storage facilities called bulk stations and bulk terminals are used to hold various refined products before distribution to dealers and consumers. In 1967 the Department of Commerce reported 26,338 petroleum bulk stations with a total storage capacity of 51.5 million barrels and 2,701 bulk terminals with 404.8 million barrels storage capacity, table 7. The Bureau of Mines collects data on the bulk terminal storage of gasolines, naphthas, jet fuel, kerosine, fuel oils, lube oils and greases, asphalt and miscellaneous finished oils from individual companies. These data are reported as totals for geographical areas, namely refinery districts, by each company (see Bureau of Mines reporting Form 6-1302-M, Bulk Terminal Stocks of Finished Petroleum Products). These companies number approximately 60. Due to the nature of this report, bulk terminal inventories of products at a lesser geographic level are not available. No data are collected by the Bureau of Mines concerning bulk stations or LP gas stations. State and county storage information is published by the Department of Commerce; the latest publication, Petroleum Bulk Stations and Terminals (BC67-WS6), covers the year 1967. Location of the bulk terminals is a function of storage requirements to provide adequate distribution of refined products to consumers.

TABLE 7. - U.S. bulk storage capacity by product, December 31, 1967
(Thousand barrels)

	Number	Aviation gasoline	Motor gasoline	Special naphthas	Jet fuels (naphthas or kerosine types)	Kerosine	Distillate fuel oils	Residual fuel oils	Liquefied petroleum gases	Total
Bulk stations	26,338	490	24,871	943	279	5,200	18,058	1,210	432	51,483
Bulk terminals	2,701	5,342	146,870	4,775	17,175	24,471	151,493	53,350	1,356	404,832
LP gas stations	1,190	4	331	1	-	26	245	16	28,305	28,928
Total U.S.	30,229	5,836	172,072	5,719	17,454	29,697	169,796	54,576	30,093	485,243

Source: U.S. Department of Commerce, Wholesale Trade Subject Reports, Petroleum Bulk Stations and Terminals, 1967, BC 67-WS6

REFINERY INPUTS AND OUTPUTS

Crude oil was produced in 31 States, refined in 39 States, and consumed in varying amounts in all 50 States. The domestic production of about 9.2 million barrels of petroleum per day and consumption of 14.1 million barrels of products in the U.S. indicates a tremendous requirement for energy. The sulfur content present in the refinery crude oil inputs and selected product outputs is part of the petroleum environmental problem.

Refinery Inputs

Refinery inputs in 1969 were derived from domestic crude oil production of about 3,189 million barrels, approximately 183 million barrels of lease condensate, and crude oil imports of 514 million barrels. An attempt has been made to exclude condensate from crude oil in quantifying the domestic production by sulfur levels because generally condensate contains very little sulfur. Crude oil production of 3,189 million barrels in 1969 was summarized from data currently in the energy data bank. Sulfur data on 2,538 million barrels of this total, table 8, are available on a field basis.

Seventy percent of the 1969 U.S. crude oil production came from the three States of Texas, Louisiana, and California, and 95 percent came from 11 States, figure 6. Individual county production by sulfur levels within districts and States is presented in table C-8. Distribution of the produced crude oil to the various refineries was via pipelines, railroads, trucks, tankers, and barges. During 1969, 76.6 percent of refinery receipts of crude oil, domestic and foreign, was delivered by pipeline; 22.2 percent by tankers and barges; and 1.2 percent by tank cars

TABLE 8. - Crude oil production and refinery receipts by P.A.D. District and States in 1969

(Thousand barrels)

	Crude oil		Receipts of crude oil		
	Production	Sulfur content for	Domestic		Foreign
			Intrastate	Total domestic	
District I:					
Delaware, Maryland	-	-	-	6,384.0	31,720
Florida, Virginia, Georgia	1,734.3	571.8	-	1,638.0	15,770
New Jersey	-	-	-	78,849.0	94,566
New York	1,255.7	1,238.3	-	2,480.0	25,965
Pennsylvania	4,878.0	2,698.0	5,489.0	113,690.0	100,986
West Virginia	3,105.0	3,105.0	1,575.0	2,864.0	-
Rhode Island	-	-	-	-	-
Total	10,973.0	7,613.1	7,064.0	205,905.0	269,007
District II:					
Illinois	50,723.4	45,042.9	21,025.0	243,734.0	210
Indiana	7,823.9	3,576.5	6,812.0	184,183.0	-
Kansas	87,011.3	44,322.5	77,849.0	136,717.0	-
Kentucky, Tennessee	13,494.5	2,627.9	8,464.0	57,330.0	-
Michigan	12,189.6	8,568.4	11,640.0	39,473.0	12,547
Minnesota, Wisconsin	-	-	-	6,556.0	49,476
Missouri, Nebraska	12,146.9	8,164.2	-	28,641.0	-
North Dakota	22,753.3	21,959.4	16,048.0	16,938.0	-
Ohio	10,971.6	7,598.0	5,983.0	140,940.0	25,859
Oklahoma	215,274.4	163,021.8	114,233.0	157,985.0	148
South Dakota	158.2	149.8	-	-	-
Total	432,547.1	305,031.4	262,054.0	1,012,497.0	88,240
District III:					
Alabama	7,685.4	7,058.0	1,150.0	8,083.0	-
Arkansas	17,159.2	12,614.2	16,516.0	30,312.0	-
Louisiana	726,968.8	529,006.0	361,014.0	423,942.0	-
Mississippi	63,413.5	22,376.8	12,537.0	59,593.0	-
New Mexico	120,060.5	73,584.5	14,184.0	14,305.0	-
Texas	1,107,143.9	899,262.4	766,763.0	1,018,207.0	-
Total	2,042,431.3	1,543,901.9	1,172,164.0	1,554,442.0	-
District IV:					
Colorado	27,886.1	20,542.2	1,680.0	13,265.0	711
Montana	44,243.1	40,987.7	12,831.0	29,328.0	10,836
Utah	23,571.4	22,829.7	10,172.0	39,375.0	-
Wyoming	156,290.6	149,735.3	45,279.0	46,386.0	1,099
Total	251,991.2	234,094.9	69,962.0	128,354.0	12,646
District V:					
California	374,175.1	370,767.1	375,767.0	450,390.0	57,584
Other States	76,953.7	76,845.7	7,905.0	13,841.0	86,375
Total	451,128.8	447,612.8	383,672.0	464,231.0	143,959
U.S. total	3,189,071.4	2,538,254.1	1,894,916.0	3,365,429.0	513,852

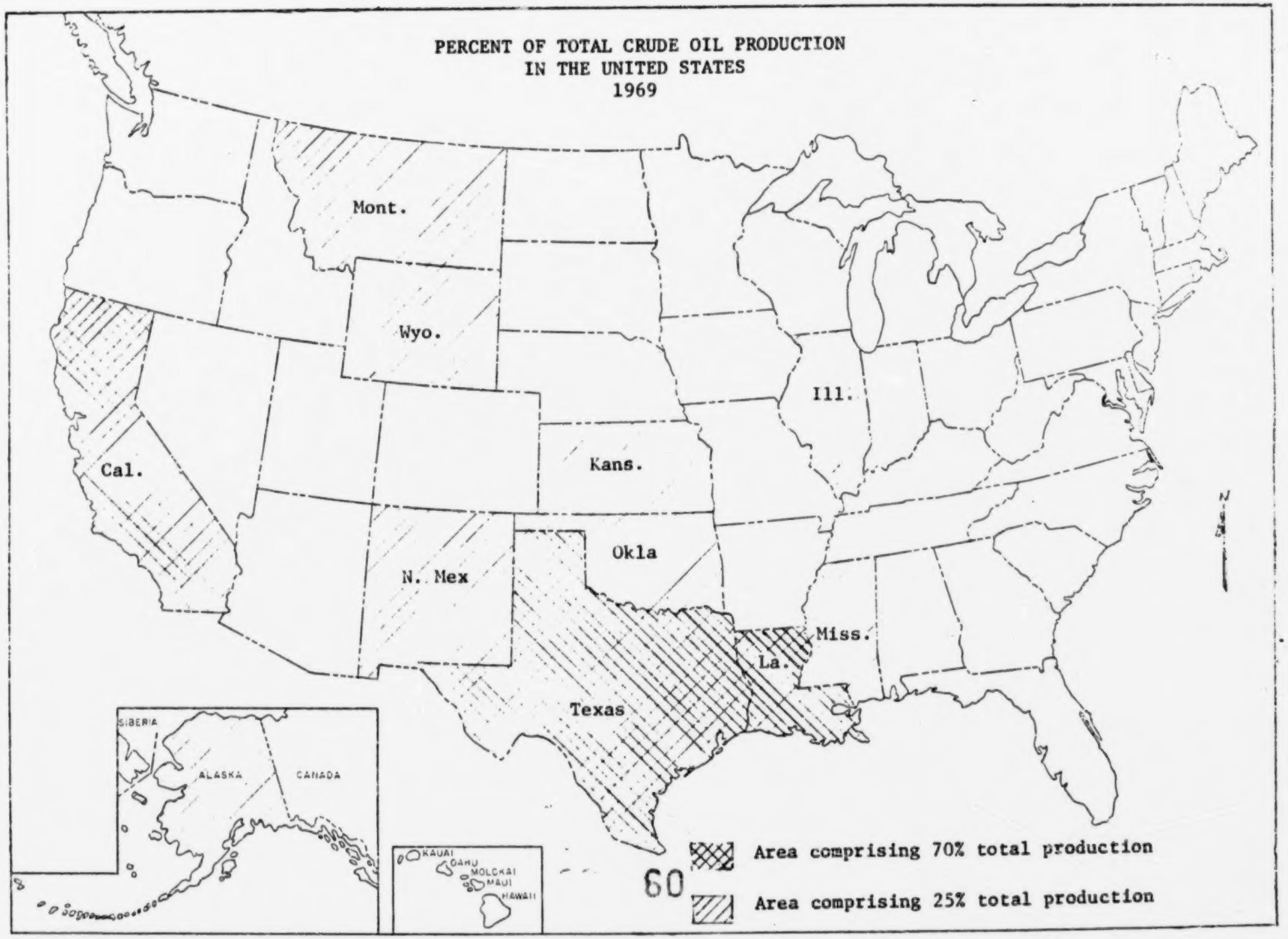

PERCENT OF TOTAL CRUDE OIL PRODUCTION
IN THE UNITED STATES
1969
Mont.
Wyo.
Cal.
Kans.
Okla
N. Mex
Texas
Ill.
Miss.
La.
SIBERIA
ALASKA
CANADA
KAUAI
OAHU
MOLCKAI
MAUI
HAWAII
N
▩ Area comprising 70% total production
▨ Area comprising 25% total production

FIGURE 6.--Percent of total crude oil production in the United States--1969 and trucks. Of the total, refinery receipts of domestic crude oil pipelines delivered 82.3 percent, tankers and barges 16.3 percent, and tank cars and trucks 1.4 percent. In the case of foreign crude receipts, pipelines accounted for 38.8 percent (all from Canada) while the rest was delivered by tankers.

During 1969 intrastate refinery receipts, domestic crude oil produced and refined within the same State, was 1,895 million barrels and 1,471 million barrels went to refineries outside the State in which it was produced, interstate receipts, table 9. Crude oil from P.A.D. III, 1,041 million barrels, was shipped to refineries principally in P.A.D. Districts II, III, and I.

It is impossible to designate crude oil production from a specific field to a particular refinery; therefore, the county production by sulfur levels is indicative only of the locality of that production. Availability of crude oil by sulfur levels, table C-8, indicates that 1,743 million barrels contained less than 0.50 percent sulfur. The distribution of this quantity of low sulfur crude oil to the various refineries is not known. Refinery conditions are such that some require total low sulfur, sweet, crude while others may blend low with high sulfur crude oil to provide a feedstock with relatively consistent sulfur content. Without definite knowledge of sulfur content in refinery feedstocks, distribution of the crude oil by sulfur levels to individual refineries can only be estimated. Refinery receipts of individual shipments by sulfur content are not reported; but table 10 shows estimates of sulfur content of refinery receipts of domestic crude oil by refinery districts and P.A.D. Districts for 1969. The data in this table were estimated by applying

TABLE 9. - Refinery receipts of crude oil, by State and PAD district in 1969

(Thousand barrels)

Receiving District and State	Intrastate receipts	Receipts from PAD I	Receipts from PAD II	Receipts from PAD III	Receipts from PAD IV	Receipts from PAD V	Domestic total	Receipts from foreign
District I:								
Delaware, Maryland	-	1,840	-	4,544	-	-	6,384	31,720
Florida, Georgia, Virginia ...	-	-	-	1,638	-	-	1,638	15,770
New Jersey	-	-	-	78,849	-	-	78,849	94,566
New York	-	-	1,535	650	295	-	2,480	25,965
Pennsylvania	5,489	2,547	5,167	95,975	4,512	-	113,690	100,986
West Virginia	1,575	-	1,289	-	-	-	2,864	-
Total	7,064	4,387	7,991	181,656	4,807	-	205,905	269,007
District II:								
Illinois	21,025	-	36,271	173,182	13,256	-	243,734	210
Indiana	6,812	-	50,238	81,941	45,192	-	184,183	-
Kansas	77,849	-	18,147	24,129	16,592	-	136,717	-
Kentucky, Tennessee	8,464	1/12	2/11,983	36,701	170	-	57,330	-
Michigan	11,640	-	3,580	14,418	9,835	-	39,473	12,547
Minnesota, Wisconsin	-	-	6,556	-	-	-	6,556	49,476
Missouri, Nebraska	-	-	6,013	15,636	6,992	-	28,641	-
North Dakota	16,048	-	-	-	890	-	16,938	-
Ohio	5,983	-	25,920	94,649	14,388	-	140,940	25,859
Oklahoma	114,233	-	3,624	37,168	2,960	-	157,985	148
Total	262,054	12	162,332	477,824	110,275	-	1,012,497	88,240
District III:								
Alabama	1,150	-	-	6,933	-	-	8,083	-
Arkansas	16,516	-	-	13,796	-	-	30,312	-
Louisiana	361,014	-	35	62,893	-	-	423,942	-
Mississippi	12,537	-	-	47,056	-	-	59,593	-
New Mexico	14,184	-	-	-	-	121	14,305	-
Texas	766,763	-	1,677	246,982	2,785	-	1,018,207	-
Total	1,172,164	-	1,712	377,660	2,785	121	1,554,442	-
District IV:								
Colorado	1,680	-	-	1	11,584	-	13,265	711
Montana	12,831	-	-	-	16,497	-	29,328	10,836
Utah	10,172	-	-	56	28,997	150	39,375	-
Wyoming	45,279	-	7	-	1,100	-	46,386	1,099
Total	69,962	-	7	57	58,178	150	128,354	12,646
District V:								
California	375,767	-	-	3,940	10,872	4/59,811	450,390	57,584
Other States 3/	7,905	-	-	-	-	5,936	13,841	86,375
Total	383,672	-	-	3,940	10,872	65,747	464,231	143,959
Total United States	1,894,916	4,399	172,042	1,041,137	186,917	66,018	3,365,429	513,852

1/ Oil from Virginia.
2/ Includes 12,000 barrels from Tennessee.
3/ Alaska, Hawaii, Oregon, and Washington.
4/ Includes 2,216,000 barrels from Arizona.

TABLE 10. - Estimated sulfur content of refinery receipts of domestic crude oil by refinery districts and P.A.D. districts, 1969

(Thousand barrels)

Districts	Percent sulfur content				Total
	0.00-0.50	0.50-1.00	1.01-2.00	More than 2.00	
P.A.D. I					
East Coast.......	143,854	12,312	12,247	14,433	182,846
Appl. #1.........	20,169	1,842	953	95	23,059
Total..........	164,023	14,154	13,200	14,528	205,905
P.A.D. II					
Appl. #2.........	18,824	2,879	558	1,467	23,728
Ind.-Ill.........	465,959	67,090	62,837	46,046	641,932
Minn.-Wisc.......	15,417	4,717	856	2,504	23,494
Okla.-Kans.......	219,080	70,965	19,861	13,437	323,343
Total..........	719,280	145,651	84,112	63,454	1,012,497
P.A.D. III					
Texas Inland.....	95,209	10,126	22,790	13,644	141,769
Texas Gulf.......	633,891	63,831	115,543	63,173	876,438
La. Gulf.........	376,880	24,272	7,227	13,798	422,177
Ark.-La. Inland..	66,627	8,786	9,873	14,467	99,753
N. Mexico........	14,245	25	23	12	14,305
Total..........	1,186,852	107,040	155,456	105,094	1,554,442
P.A.D. IV..........	57,070	19,574	21,407	30,303	128,354
P.A.D. V...........	272,882	80,129	73,164	38,056	464,231
U.S..............	2,400,107	366,548	347,339	251,435	3,365,429
Percent........	71.3	10.9	10.3	7.5	100.0

Note: Data estimated by applying percentage distribution of sulfur contained in domestic crude oils (devised from table 3) to refinery receipts.

the percentage distribution of sulfur contained in domestic crudes as shown in table 3 to the data on refinery receipts of crude by State of origin.

The average wellhead value of crude oil in 1969 for 26 of the oil producing States is tabulated in table 11. The average value ranged from a low of $2.29 per barrel in South Dakota to a high of $4.52 in New York and Pennsylvania with the average for the United States of $3.09. Price of crude oil in Texas ranged from $3.14 in West Texas to a high of $3.42 for Gulf Coast crude, table 12.

Refinery Output

Of the multitude of products manufactured by refineries, this study is concerned with only four; these are residual and No. 4 fuel oils, other distillates, and naphtha. Of these four, emphasis was placed upon residual and No. 4 distillate fuel oil in determining the quantity produced and the sulfur content. Standards normally specify less than 0.5 percent sulfur in distillate fuel oils except No. 4 fuel oil; therefore, sulfur data was requested for only No. 4 distillate fuel oil.

Beginning in December 1970, supplements were sent with the monthly refinery reports to refinery companies requesting the quantity and sulfur content of residual and No. 4 fuel oil shipments and stocks. These data were subsequently entered in the data bank as each month was received, and the four months of December 1970, January, February, and March 1971 constitute the sulfur information available for refinery output of residual and No. 4 fuel oils. No sulfur data for P.A.D. District V was reported for December 1970.

TABLE 11. - Average wellhead value of crude oil for 1969

P.A.D. Districts and States	$/Barrel
District I	
New York	4.52
Pennsylvania	4.52
West Virginia	3.83
District II	
Illinois	3.18
Indiana	3.19
Kansas	3.20
Kentucky	3.11
Michigan	3.07
Nebraska	2.98
North Dakota	2.80
South Dakota	2.29
Ohio	3.29
Oklahoma	3.12
District III	
Alabama	2.70
Arkansas	2.83
Louisiana	3.30
Mississippi	2.92
New Mexico	3.13
Texas	3.21
District IV	
Colorado	3.12
Montana	2.69
Utah	2.80
Wyoming	2.80
District V	
Alaska	2.90
Arizona	2.90
California	2.45
Total United States	3.09

TABLE 12. - District average wellhead value of crude oil for 1969

States	$/Barrel
Louisiana:	
Gulf Coast	3.31
Northern	3.22
New Mexico:	
Southeastern	3.15
Northwestern	2.86
Texas:	
Gulf Coast	3.42
East Texas Field	3.24
West Texas	3.14
Panhandle	3.17
Rest of State	3.17

Other data pertinent to refineries entered in the data bank consisted of refinery reports in 1970 and refinery capacity data. One month from each quarter of 1970, March, June, September, and December, was selected and the individual refinery data was entered in the computer system. Also, capacity information as of December 31, 1969, for each refinery was made part of the system. Programs developed by the Bureau of Mines compiled the data in various ways for inclusion in this report.

Shipments of residual fuel oil from refineries during the first quarter of 1971 amounted to 89,578,000 barrels, table C-2. Of this quantity 35,205,000 contained less than one percent sulfur and refineries in P.A.D. District I shipped only 3,806,000 barrels. P.A.D. District V was the largest producer of residual fuel oil with over 10 million barrels each month. P.A.D. Districts III and V each produced about the same quantity of residual fuel oil containing less than 1 percent sulfur during the quarter; their combined total was 23.2 million barrels. Of the total residual fuel oil shipped during the quarter, 54.4 million barrels, 61 percent, contained over one percent sulfur. Obviously, to utilize this residual fuel oil in areas requiring less than one percent sulfur would necessitate sulfur removal or blending with lower sulfur fuel oils to form an acceptable fuel.

Stocks of residual fuel oil held at refineries, table C-3, was about 26 million barrels each month during the first quarter of 1971. The quantity containing less than one percent sulfur, about 9 million barrels each month, represented about 35 percent of the total stocks. Relationship of shipments to stocks of residual fuel oil in the respective areas was approximately the same.

No. 4 distillate fuel oil was manufactured by very few refineries; this type distillate is normally the product of blending at terminals. During the first quarter of 1971, shipments from refineries were 3,829,000 barrels and 2,951,000 barrels contained less than 0.5 percent sulfur, table C-4. During 1969, imports of No. 4 fuel oil were 27,392,000 barrels, all of which went to P.A.D. District I. Stocks of No. 4 fuel oil held at refineries, table C-5, were 1,594,000 barrels in January 1971 and averaged 1,436,000 barrels each month during the quarter. Average quantity containing less than one percent sulfur was 1,248,000 barrels for each month and 860,000 barrels were in the 0 to 0.5 percent category.

Refinery production of distillate fuel oils (including No. 4 fuel oil) increased from 847 million barrels in 1969 to 896 million barrels in 1970. Texas Gulf Coast refinery district was the largest producing area of all distillate fuel oils with 229 million barrels, table 13. Storage of distillate fuel oil each month at bulk terminal facilities, indicates that about 55 percent was stored on the east coast. Therefore, P.A.D. District I received much of the distillate fuel oil produced in the other P.A.D. Districts.

Domestic demand by use of distillates (including No. 4) and residual fuel oils is tabulated in table 14. Over 50 percent of the distillate was used as heating oils while the largest use of residual fuel oil was in public utility power plants. The nine year history, 1961-69, of demand by use indicates the requirements for distillate and residual fuel oils. State breakdown by sales of distillate-type heating oils, table 15, and residual-type heating oils, table 16, shows No. 2 distillate and No. 6 residual fuel oils were in the greatest demand.

TABLE 13. - Annual refinery distillate fuel production in the United States by refining and P.A.D. districts

(Thousand barrels)

	1968	1969	1970
By refining district:			
P.A.D. I			
East Coast	120,821	124,465	127,280
Appalachian No. 1	11,759	12,342	12,938
P.A.D. II			
Appalachian No. 2	4,528	5,129	5,523
Indiana, Illinois, Kentucky, etc.	135,746	135,896	152,920
Minnesota, Wisconsin, etc	16,780	17,687	18,630
Oklahoma, Kansas, etc	76,681	78,224	77,962
P.A.D. III			
Texas Inland	22,840	24,365	25,787
Texas Gulf Coast	229,489	213,560	228,836
Louisiana Gulf Coast	102,053	108,334	120,587
Arkansas, Louisiana Inland, etc	12,258	12,807	14,239
New Mexico	2,351	2,646	2,897
P.A.D. IV			
Rocky Mountain	32,138	34,318	34,587
P.A.D. V			
West Coast	71,929	77,090	73,470
Total	839,373	846,863	895,656

TABLE 14. - Distillate and residual fuel oil domes

(Thousand barrels)

Year	No. 1 as Range oil	Heating oils	Industrial uses	Oil company fuel	Gas and electric public utility power plants	Railroads	Ve bunk (inc tan
						DISTILLATE FUEL OIL	
1961	15,487	434,805	31,226	8,743	4,151	85,180	14,
1962	16,799	450,031	34,951	9,055	4,100	86,803	15,
1963	16,156	449,159	36,647	10,253	4,149	88,117	15,
1964	15,656	436,204	36,007	10,576	3,849	88,198	16,
1965	19,064	456,928	42,484	10,430	3,661	86,436	15,
1966	17,601	455,177	47,108	10,485	3,612	89,104	16,
1967	20,505	480,521	44,997	8,997	1/2,858	88,688	17,
1968	15,883	494,799	45,795	9,975	2/8,509	84,030	18,
1969	14,396	497,372	42,456	13,867	12,158	86,429	18,
						RESIDUAL FUEL OIL	
1961		121,097	153,766	44,399	87,881	5,347	87,
1962		125,164	156,221	45,978	88,261	5,501	84,
1963		125,248	149,269	46,976	91,615	5,342	76,
1964		126,215	157,176	43,098	97,595	5,350	83,
1965		156,254	140,602	34,354	114,884	4,001	73,
1966		167,471	141,050	35,177	140,642	3,792	73,
1967		175,990	131,819	37,880	1/158,417	5,494	80,
1968		174,326	135,664	39,329	184,956	4,296	87,
1969		178,095	130,654	36,559	247,634	3,381	85,

1/ Electric public utility power plants only.
2/ These figures and those for subsequent years include data for gas turbine plants.

istillate and residual fuel oil domestic demand by use, 1961-69

(Thousand barrels)

el	Gas and electric public utility power plants	Railroads	Vessel bunkering (including tankers)	Military uses	Diesel fuel used on highways	Miscellaneous uses	Total domestic demand
	DISTILLATE FUEL OIL						
	4,151	85,180	14,566	11,484	40,972	47,742	694,356
	4,100	86,803	15,836	13,041	49,236	52,553	732,405
	4,149	88,117	15,148	13,436	66,773	47,416	747,254
	3,849	88,198	16,001	13,609	76,131	54,193	750,424
	3,661	86,436	15,532	14,953	73,776	52,550	775,814
	3,612	89,104	16,642	16,303	81.516	59,832	797,380
	1/2,858	88,688	17,478	17,325	1/	136,781	818,150
	2/8,509	84,030	18,235	12,593	124,082	60,638	874,539
	12,158	86,429	18,877	13,958	138,814	61,935	900,262
	RESIDUAL FUEL OIL						
	87,881	5,347	87,308	36,762		12,118	548,678
	88,261	5,501	84,415	35,667		4,606	545,813
	91,615	5,342	76,502	36,444		7,528	538,924
	97,595	5,350	83,024	35,568		6,555	554,581
	114,884	4,001	73,639	40,380		22,897	587,011
	140,642	3,792	73,641	41,861		22,796	626,430
	1/158,417	5,494	80,680	40,465		21,140	651,885
	184,956	4,296	87,575	34,990		7,103	668,239
	247,634	3,381	85,581	31,750		8,270	721,924

clude data for gas turbine plants.

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Table 15.—Sales of Distillate-type Heating Oils in the United States, by P.A.D. District and State: 1969 and 1968

(Thousand barrels)

	Heating Oils					
	1969					1968 Total
	No. 1		No. 2	No. 4	Total	
	Automatic burners	Other heating				
District 1:						
Connecticut	219	141	16,896	1,525	18,781	18,253
Delaware	245	128	2,891	10	3,274	3,190
District of Columbia	74	400	2,090	165	2,729	2,883
Florida	101	560	3,178	78	3,917	4,459
Georgia	89	111	1,919	-	2,119	2,330
Maine	262	636	8,009	208	9,115	8,539
Maryland	238	57	11,775	182	12,252	12,603
Massachusetts	961	337	49,461	2,183	52,942	50,925
New Hampshire	170	183	6,637	45	7,035	6,643
New Jersey	384	150	40,361	7,828	48,723	47,783
New York	2,045	684	79,449	10,360	92,538	91,313
North Carolina	723	568	10,614	51	11,956	12,012
Pennsylvania	800	252	37,932	1,725	40,709	40,502
Rhode Island	37	105	7,068	100	7,310	6,577
South Carolina	266	266	3,761	100	4,393	4,275
Vermont	154	67	4,644	83	4,948	4,506
Virginia	527	255	10,261	254	11,297	12,215
West Virginia	4	2	593	6	605	637
Total 1969	7,299	4,902	297,539	24,903	334,643	-
Total 1968	8,557	5,873	291,759	23,456	-	329,645
District 2:						
Illinois	2,316	695	19,429	952	23,392	23,407
Indiana	1,727	1,022	14,068	250	17,067	17,149
Iowa	1,453	487	5,204	16	7,160	8,015
Kansas	106	18	609	11	744	909
Kentucky	251	67	1,333	32	1,683	1,864
Michigan	4,943	1,869	19,347	301	26,460	26,578
Minnesota	2,380	983	10,914	154	14,431	15,036
Missouri	537	438	4,918	222	6,115	6,523
Nebraska	285	107	1,578	-	1,970	2,207
North Dakota	730	133	2,663	14	3,540	3,777
Ohio	1,427	185	13,398	239	15,249	15,573
Oklahoma	99	91	529	-	719	663
South Dakota	632	124	1,477	-	2,233	2,642
Tennessee	49	65	1,801	-	1,915	2,008
Wisconsin	2,457	958	15,883	542	19,840	20,859
Total 1969	19,392	7,242	113,151	2,733	142,518	-
Total 1968	21,143	8,083	115,617	2,367	-	147,210
District 3:						
Alabama	18	8	301	-	327	383
Arkansas	28	14	346	-	388	256
Louisiana	32	19	606	-	657	332
Mississippi	26	30	671	-	727	280
New Mexico	8	30	187	-	225	175
Texas	413	240	1,040	3	1,696	1,055
Total 1969	525	341	3,151	3	4,020	-
Total 1968	513	312	1,650	6	-	2,481
District 4:						
Colorado	355	257	617	-	1,229	1,080
Idaho	876	689	1,708	3	3,276	5,476
Montana	89	564	544	-	1,197	1,045
Utah	92	364	667	32	1,155	928
Wyoming	14	37	670	1	722	579
Total 1969	1,426	1,911	4,206	36	7,579	-
Total 1968	1,797	1,615	5,646	50	-	9,108
District 5:						
Alaska	848	-	1,660	-	2,508	2,461
Arizona	62	-	115	-	177	156
California	293	-	947	-	1,240	1,111
Hawaii	19	-	109	-	128	97
Nevada	95	-	376	-	471	463
Oregon	1,958	-	4,827	-	6,785	6,690
Washington	3,387	-	8,312	-	11,699	11,260
Total 1969	6,662	-	16,346	-	23,008	-
Total 1968	6,302	-	15,936	-	-	22,238
United States total, 1969	35,304	14,396	434,393	27,675	511,768	-
United States total, 1968	38,312	15,883	430,608	25,879	-	510,682

Table 16.—Sales of Residual-Type Heating Oils in the United States, by P.A.D. District and State: 1969 and 1968

(Thousand barrels)

P.A.D. District and State	Heating oils					
	No. 5		No. 6		Total	
	1969	1968	1969	1968	1969	1968
District 1:						
Connecticut	34	227	4,706	3,630	4,740	3,857
Delaware	195	135	228	181	423	316
District of Columbia	505	762	7,161	6,841	7,666	7,603
Florida	100	51	400	745	500	796
Georgia	1,542	597	806	529	2,348	1,126
Maine	385	141	1,582	1,177	1,967	1,318
Maryland	1,301	1,383	3,817	3,134	5,118	4,517
Massachusetts	7,544	7,498	22,129	24,277	29,673	31,775
New Hampshire	382	120	635	322	1,017	442
New Jersey	1,170	1,102	11,659	11,912	12,829	13,014
New York	1,994	2,718	57,533	57,524	59,527	60,242
North Carolina	579	552	503	432	1,082	984
Pennsylvania	4,941	5,635	6,447	6,294	11,388	11,929
Rhode Island	420	325	1,367	1,204	1,787	1,529
South Carolina	247	220	58	147	305	367
Vermont	18	39	123	81	141	120
Virginia	430	653	1,304	1,893	1,734	2,546
West Virginia	170	113	21	47	191	160
Total	21,957	22,271	120,479	120,370	142,436	142,641
District 2:						
Illinois	7,526	6,896	7,138	6,910	14,664	13,806
Indiana	524	329	1,786	1,355	2,310	1,684
Iowa	142	154	61	66	203	220
Kansas	10	33	16	46	26	79
Kentucky	6	4	97	17	103	21
Michigan	422	365	833	480	1,255	845
Minnesota	593	119	421	78	1,014	197
Missouri	1,004	1,367	640	670	1,644	2,037
Nebraska	62	84	73	124	135	208
North Dakota	10	4	10	2	20	6
Ohio	101	124	328	249	429	373
Oklahoma	2	-	5	10	7	10
South Dakota	33	3	26	15	59	18
Tennessee	10	25	-	-	10	25
Wisconsin	679	430	324	350	1,003	780
Total	11,124	9,937	11,758	10,372	22,882	20,309
District 3:						
Alabama	74	74	-	-	74	74
Arkansas	-	-	-	-	-	-
Louisiana	-	-	6	-	6	-
Mississippi	50	-	50	-	100	-
New Mexico	2	4	-	-	2	4
Texas	73	65	503	114	576	179
Total	199	143	559	114	758	257
District 4:						
Colorado	223	215	223	112	446	327
Idaho	62	31	103	47	165	78
Montana	200	284	26	135	226	419
Utah	389	277	373	288	762	565
Wyoming	215	100	295	203	510	303
Total	1,089	907	1,020	785	2,109	1,692
District 5:						
Alaska	3	-	19	13	22	13
Arizona	19	19	16	16	35	35
California	942	938	1,495	1,490	2,437	2,428
Hawaii	110	101	159	148	269	249
Nevada	27	30	24	29	51	59
Oregon	2,060	1,868	1,340	1,135	3,400	3,003
Washington	2,327	2,292	1,369	1,348	3,696	3,640
Total	5,488	5,248	4,422	4,179	9,910	9,427
United States, total	39,857	38,506	138,238	135,620	178,095	174,326

Supply and demand for distillate and residual fuel oils are shown in tables 17 and 18. Historically, increases in demand for distillate fuel oils have come primarily from domestic production, but generally domestic production of residual fuel oil has declined. To meet increasing demand for residual fuel oil, imports have increased over 100 percent in the last decade. In 1970, domestic demand for distillate fuel oil was 927 million barrels, and for residual fuel oil, 804 million barrels.

Fuel oil prices for selected cities remained constant in some localities but increased in others from 1969, table 19, to 1970, table 20. Average price for large quantity shipments of No. 2 fuel oil for 52 cities was 16.9 cents per gallon in 1970 compared to 16.4 cents in 1969. Prices of Nos. 4, 5, and 6 fuel oils were higher in 1970, table 20, and the no sulfur guarantee price increased an average of $.59 per barrel for No. 5 and $.63 for No. 6 fuel oil.

In 1969 the U.S. average retail price for No. 2 fuel oil was 17.80 cents per gallon and $7.48 per barrel according to the Bureau of Labor Statistics. In 1970 the average price increased to 18.48 cents per gallon and $7.76 per barrel; these prices include applicable taxes.

TABLE 17. - Distillate fuel oil supply and demand, 1960-70

(Thousand barrels)

Year	Production	Crude used directly1/	Imports	Total	Stocks end of period	Change in stocks	Domestic demand	Exports
1960	667,050	2,635	12,771	682,456	138,455	-12,709	685,268	9,897
1961	696,015	1,458	17,377	714,850	152,018	+13,563	694,356	6,931
1962	719,590	1,695	11,831	733,116	144,505	-7,513	732,405	8,224
1963	764,597	1,277	9,110	774,984	156,677	+12,716	747,254	15,014
1964	742,046	1,148	11,785	754,979	155,846	-831	750,424	5,386
1965	765,071	1,132	13,002	779,205	155,407	-439	775,814	3,830
1966	784,717	1,884	13,845	800,446	154,096	-1,311	797,380	4,377
1967 2/	804,788	730	18,492	824,010	159,703	+1,591	818,150	4,269
1968	840,681	712	48,148	889,541	173,158	+13,455	874,539	1,547
1969	848,404	654	50,883	899,941	171,714	-1,444	900,262	1,123
1970	897,097	743	53,903	951,743	195,271	+23,557	927,250	936
1970								
January ...	79,486	59	6,686	86,231	130,726	-40,988	127,190	29
February ..	71,879	55	5,707	77,641	111,523	-19,203	96,775	69
March	77,662	67	7,581	85,310	100,983	-10,540	95,776	74
April	70,791	61	4,550	75,402	102,061	+1,078	74,191	133
May	70,785	55	3,384	74,224	115,846	+13,785	60,334	105
June	72,295	85	1,872	74,252	137,506	+21,660	52,574	18
July	73,521	46	2,840	76,407	163,469	+25,963	50,269	175
August	74,818	57	2,762	77,637	188,169	+24,700	52,890	47
September .	73,375	65	2,777	76,217	205,674	+17,505	58,645	67
October ...	76,693	67	3,986	80,746	216,386	+10,712	69,922	112
November ..	75,261	68	5,095	80,424	218,138	+1,752	78,636	36
December ..	80,531	58	6,663	87,252	195,271	-22,867	110,048	71
Total	897,097	743	53,903	951,743		+23,557	927,250	936

1/ Includes transfers from gas plants.
2/ Production and stocks at gas processing plants are included in this and subsequent years.

TABLE 18. - Residual fuel oil supply and demand, 1961-1970
(Thousand barrels)

Year	Production	Crude used directly	Imports	Stocks end of period	Change in stocks	Domestic demand	Exports
1961	315,577	3,854	243,268	44,869	- 1	548,678	14,022
1962	295,679	3,797	264,314	49,996	+ 5,127	545,813	12,850
1963	275,910	3,305	272,753	47,538	- 2,237	538,924	15,281
1964	266,825	3,720	295,771	40,403	- 7,135	554,581	18,870
1965	268,567	3,950	345,187	56,214	+15,811	587,011	14,882
1966	263,961	3,551	376,795	61,196	+ 4,982	626,430	12,895
1967	275,956	3,671	395,939	65,597	+ 1,741	651,885	21,940
1968	275,814	4,272	409,928	67,359	+ 1,762	668,239	20,013
1969	265,906	4,334	461,611	58,395	- 6,964	721,924	16,891
1970	257,510	4,317	557,845	53,994	- 4,401	804,287	19,786
1970							
Jan.	25,963	378	55,998	49,544	- 8,851	89,716	1,474
Feb.	23,947	333	56,529	46,068	- 3,476	82,169	2,116
Mar.	23,639	479	58,488	40,320	- 5,748	87,251	1,103
Apr.	19,829	355	47,304	42,791	+ 2,471	63,642	1,375
May	17,676	442	36,825	44,664	+ 1,873	51,276	1,794
June	17,020	341	43,581	46,036	+ 1,372	58,221	1,349
July	17,688	372	44,686	47,886	+ 1,850	59,166	1,730
Aug.	20,670	375	41,659	48,141	+ 255	61,226	1,223
Sept.	19,868	292	39,119	53,954	+ 5,813	50,654	2,812
Oct.	20,044	315	42,927	57,130	+ 3,176	58,864	1,246
Nov.	22,230	344	41,777	58,823	+ 1,693	61,706	952
Dec.	28,936	291	48,952	53,994	- 4,829	80,396	2,612
Total	257,510	4,317	557,845		- 4,401	804,287	19,786

TABLE 19. - Fuel oil prices for selected cities, 1969

	Distillate-Tankwagon[1]		Residual fuel oils-terminals[2]					
	#2 Fuel oil		#4 Fuel oil	#5 Fuel oil No sulfur Guarantee	#5 Fuel oil 1% Max.S.	#6 Fuel oil No sulfur Guarantee	#6 Fuel oil 1% Max.S.
	¢/gal.	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.
Albany, N.Y..........	16.7	7.01	3.67			2.41	
Albuquerque..........	NA						
Atlanta..............	NA						
Baltimore............	16.8	7.06	3.26	2.97		2.21	
Bangor, Me...........	18.3	7.69					
Baton Rouge..........	14.9	6.26		2.83		2.33	
Billings.............	16.3	6.85					
Birmingham...........	16.4	6.89					
Boston...............	16.9	7.10	3.53	3.11		2.21	
Buffalo..............	16.9	7.10			8.80	7.55	8.15
Casper...............	15.3	6.43					
Charleston, S.C......	17.9	7.52		2.96		2.37	
Charleston, W. Va....	NA						
Charlotte............	15.5	6.51					
Chattanooga..........	15.6	6.55					
Chicago..............	16.7	7.01		8.63	9.26	7.38	7.95
Cincinnati...........	16.9	7.10					
Cleveland............	16.9	7.10					
Columbus.............	16.9	7.10					
Dallas...............	15.3	6.43					
Davenport, Ia........	16.9	7.10					
Denver...............	14.9	6.26					
Des Moines...........	16.9	7.10					
Detroit..............	16.9	7.10		8.60	8.85	8.10	8.35
El Paso..............	14.7	6.17					

TABLE 19. - Fuel oil prices for selected cities, 1969--Continued

	Distillate-Tankwagon1/		Residual fuel oils-terminals2/				
	#2 Fuel oil		#4 Fuel oil	#5 Fuel oil No sulfur Guarantee	#5 Fuel oil 1% Max.S.	#6 Fuel oil No sulfur Guarantee	#6 Fuel oil 1% Max.S.
	¢/gal.	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.
Fargo, N.D.	17.0	7.14					
Houston	13.8	5.80				2.18	
Indianapolis	16.9	7.10					
Jackson, Miss.	17.0	7.14					
Jacksonville	16.0	6.72				2.35	
Kansas City, Kans.	16.7	7.01					
Kansas City, Mo.	16.7	7.01					
Little Rock	15.1	6.34					
Los Angeles	15.9	6.68				1.53	
Louisville	17.5	7.35					
Memphis	15.0	6.30					
Miami	16.1	6.76				2.33	
Milwaukee	17.2	7.22					
Minneapolis-St. Paul	17.4	7.31		9.25		8.50	
New Haven	18.9	7.94	3.60			2.39	
New Orleans	14.9	6.26		2.83		2.33	
New York	16.9	7.10	3.18	2.80		2.83	2.45
Newark	16.4	6.89					2.33
Norfolk	16.4	6.89	3.20	2.85		2.21	
Oklahoma City	14.8	6.22				1.71	1.96
Omaha	17.4	7.31					
Philadelphia	16.3	6.85	3.43	3.20		2.32	3.10
Phoenix	17.5	7.35					
Pittsburgh	16.9	7.10					
Portland, Me.	17.3	7.27		3.22		2.44	

TABLE 19. - Fuel oil prices for selected cities, 1969--Continued

	Distillate-Tankwagon[1]			Residual fuel oils-terminals[2]			
	#2 Fuel oil		#4 Fuel oil	#5 Fuel oil No sulfur Guarantee	#5 Fuel oil 1% Max.S.	#6 Fuel oil No sulfur Guarantee	#6 Fuel oil 1% Max.S.
	¢/gal.	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.
Providence..........	16.9	7.10	3.34	3.21		2.43	
Pueblo, Colo.........	15.9	6.68					
Richmond, Va.........	16.2	6.80					
St. Louis............	16.9	7.10					
Salt Lake City.......	15.8	6.64					
San Francisco........	16.3	6.85				2.31	
Seattle..............	16.8	7.06					
Shreveport...........	15.5	6.51					
Sioux Falls..........	17.4	7.31					
Tulsa................	14.6	6.13					
Twin Falls, Id.......	18.0	7.56					
Washington...........	16.3	6.85					
Wichita..............	16.7	7.01					

[1] Yearend prices - Product Tankwagon - Maximum quantity deliveries, ex-Taxes - Oil Daily.

[2] Prices computed from the yearly low and high averages - Not from daily averages - ex-Tax, Platt's Oil Price Handbook and Oil Manac - 46th Edition, 1969.

TABLE 20. - Fuel oil prices for selected cities, 1970

	Distillate-Tankwagon1/		Residual fuel oils-terminals2/				
	#2 Fuel oil		#4 Fuel oil	#5 Fuel oil No sulfur Guarantee	#5 Fuel oil 1% Max.S.	#6 Fuel oil No sulfur Guarantee	#6 Fuel oil 1% Max.S.
	¢/gal.	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.
Albany, N.Y..........	16.7	7.01	4.08			3.02	
Albuquerque..........	NA						
Atlanta..............	NA						
Baltimore............	17.4	7.31	3.79	3.44		2.85	
Bangor, Me...........	18.3	7.69					
Baton Rouge..........	NA			3.03[3]		2.58[3]	
Billings.............	16.3	6.85					
Birmingham...........	NA						
Boston...............	17.9	7.52	3.96	3.64		2.82	
Buffalo..............	17.9	7.52			8.83[3]	8.44	8.15[3]
Casper...............	15.7	6.59					
Charleston, S.C......	17.9	7.52		3.50		2.85	
Charleston, W.Va.....	NA						
Charlotte............	17.9	7.52					
Chattanooga..........	15.6	6.55					
Chicago..............	17.6	7.39		9.78	10.28	8.61	9.18
Cincinnati...........	17.9	7.52					
Cleveland............	17.9	7.52					
Columbus.............	17.9	7.52					
Dallas...............	14.8	6.22					
Davenport, Ia........	17.6	7.39					
Denver...............	16.7	7.01					
Des Moines...........	16.5	6.93					
Detroit..............	17.9	7.52		9.28	9.53	8.67	8.92
El Paso..............	NA						
Fargo, N.D...........	17.0	7.14					
Houston..............	14.8	6.22				2.47[3]	

TABLE 20. - Fuel oil prices for selected cities, 1970--Continued

	Distillate-Tankwagon1/		Residual fuel oils-terminals2/				
	#2 Fuel oil		#4 Fuel oil	#5 Fuel oil No sulfur Guarantee	#5 Fuel oil 1% Max.S.	#6 Fuel oil No sulfur Guarantee	#6 Fuel oil 1% Max.S.
	¢/gal.	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.
Indianapolis.........	16.9	7.10					
Jackson, Miss........	17.0	7.14					
Jacksonville.........	NA					2.89	
Kansas City, Kans....	17.3	7.27					
Kansas City, Mo......	17.3	7.27					
Little Rock..........	15.6	6.55					
Los Angeles..........	15.9	6.68				2.23	
Louisville...........	17.5	7.35					
Memphis..............	15.0	6.30					
Miami................	NA					2.86	
Milwaukee............	17.9	7.52					
Minneapolis-St. Paul.	17.7	7.43		10.18		9.24	
New Haven............	18.9	7.94	4.02			2.88	
New Orleans..........	14.4	6.05		3.043/		2.583/	
New York.............	18.4	7.73	3.82	3.62			3.29
Newark...............	17.5	7.35					3.384/
Norfolk..............	16.3	6.85	3.67	3.48		2.75	
Oklahoma City........	15.1	6.34				2.35	2.52
Omaha................	NA						
Philadelphia.........	17.9	7.52	3.91	3.69		3.16	
Phoenix..............	20.5	8.61					
Pittsburgh...........	17.4	7.31					
Portland, Me.........	17.3	7.27		3.69		3.16	
Providence...........	16.9	7.10	3.89	3.74		2.91	
Pueblo, Colo.........	16.7	7.01					
Richmond, Va.........	16.2	6.80					

TABLE 20. - Fuel oil prices for selected cities, 1970--Continued

	Distillate-Tankwagon[1/]			Residual fuel oils-terminals[2/]				
	#2 Fuel oil		#4 Fuel oil	#5 Fuel oil No sulfur Guarantee	#5 Fuel oil 1% Max.S.	#6 Fuel oil No sulfur Guarantee	#6 Fuel oil 1% Max.S.
	¢/gal	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.	$/bbl.
St. Louis............	NA						
Salt Lake City.......	16.4	6.89					
San Francisco........	16.3	6.85					
Seattle..............	16.8	7.06				2.93	
Shreveport...........	15.1	6.34					
Sioux Falls..........	NA						
Tulsa................	14.9	6.26					
Twin Falls, Id.......	16.2	6.80					
Washington...........	17.5	7.35					
Wichita..............	17.3	7.27					

1/ Yearend prices - Product Tankwagon - Maximum quantity deliveries, ex-Taxes - Oil Daily.
2/ Prices computed from the yearly low and high averages - Not from daily averages - ex-Tax, Platt's Oil Price Handbook and Oil Manac - 46th Edition, 1970.
3/ Partial average.
4/ Statewide, New Jersey.

DOMESTIC DISTILLATE (NO. 2 GRADE BURNER) FUEL OILS

Table 21 summarizes analyses of some domestically produced distillate fuel as reported in the latest annual Bureau of Mines, Mineral Industry Survey, Burner Fuel Oil Survey.

TABLE 21. - Summary of domestic distillate (grade No. 2 burner fuel oils analyses), 1969 and 1970

Region	Samples		Sulfur Content Weight Percent					
			Minimum		Maximum		Arithmetic Average	
	1969	1970	1969	1970	1969	1970	1969	1970
Eastern	61	57	.03	.04	.50	.49	.228	.210
Southern	20	17	.05	.04	.38	.35	.174	.172
Central	43	35	.05	.04	.56	.60	.273	.281
Rocky Mountain	18	19	.02	.06	.64	1/	.281	.316
Western	22	21	.02	.02	.74	.42	.240	.213
Total	164	149	--	--	--	--	--	--

1/ Burner fuel survey shows 1.50 as a maximum sulfur content; however, this value does not meet ASTM requirements for this grade fuel oil. The highest reported sulfur in Rocky Mountain Region meeting requirements was 0.51 percent.

1969 ASTM maximum sulfur requirement 0.70 weight percent
1970 ASTM maximum sulfur requirement 0.50 weight percent

Individual sample data shown in tables 22 and 23 were obtained under a cooperative agreement between the American Petroleum Institute and the Bureau of Mines at the request of the National Oil Fuel Institute, Inc., and the petroleum industry. The survey was designed to provide analytical data on the characteristics of burner-fuel sold in 16 marketing districts and produced in 5 regional districts. The regional and

TABLE 22

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1969

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
Eastern region: Districts A, B, and C			
101	B2	32.3	0.12
102	B	35.3	.26
103	B1, A2	31.0	.20
104	B3, A3	35.2	.50
105	B, A	32.6	.22
106	B, A	33.2	.38
107	B, A	34.6	.48
108	B, A, C	32.5	.27
109	B, A, C	35.9	.35
110	B, A, C	36.4	.13
111	B1, A1, D3	31.5	.28
112	B1, A1, D4	32.2	.20
113	B, A, D	31.3	.15
114	B, A, D	33.0	.06
115	B, A, D	31.6	.13
116	B, A, D	34.7	.14
117	B1, A1, E3, D4	31.9	.21
118	B1, C3	32.0	.21
119	B, C	35.8	.20
120	B, C, A	34.3	.35
121	B, C, A	37.1	.03
122	B, C, A	33.8	.08
123	B1, C2, D3, A4	33.0	.20
124	B1, C2, D3, A4	36.0	.21
125	B, C, E, A	34.2	.182
126	B, D	35.1	.10
127	C1	34.7	.16
128	C2	35.3	.23
129	C2	42.1	.189
130	C2	34.1	.40

TABLE 22, CONTINUED

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1969

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
131	C3	37.2	.28
132	C3	43.8	.12
133	C3	42.7	.06
134	C3	42.8	.11
135	C	43.2	.06
136	C	32.9	.41
137	C	35.0	.20
138	C	32.8	.22
139	C	31.7	.34
140	C, B, A, D 1	30.2	.25
141	C, E 1	34.1	.39
142	C, E	35.8	.08
143	C, E	36.0	.19
144	C, E	35.7	.343
145	C, E	39.3	.12
146	C, E	34.1	.12
147	C, E	3/ 23.3	.49
148	C, E	3/ 21.9	.43
149	C, E, A	34.8	.13
150	C, E, A	37.6	.14
151	C, E, F, G 1	34.3	.44
152	D, A, B, C, E	38.6	.09
153	D, A, B, C, E	35.7	.14
154	D1, B1, C3	35.5	.22
155	D3, B3, C3	34.8	.11
156	D, B, J, G	34.4	.16
161	E1, C3	34.2	.49
162	E, C	34.3	.22
163	E, C, G 1	34.8	.48
164	E, C, G, F	32.5	.28
165	E, F, G, C	35.9	.19
Average (61 samples)		34.6	.228
Minimum		21.9	.03
Maximum		43.8	.50

TABLE 22, CONTINUED

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1969

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
Southern region:	District D		
152	D, A, B, C, E	38.6	0.09
153	D, A, B, C, E	35.7	.14
154	D1, B1, C3	35.5	.22
155	D3, B3, C3	34.8	.11
156	D, B, J, G	34.4	.16
157	D, E, G 1	40.1	.38
111	B1, A1, D3	31.5	.28
112	B1, A1, D4	32.2	.20
113	B, A, D	31.3	.15
114	B, A, D	33.0	.06
115	B, A, D	31.6	.13
116	B, A, D	34.7	.14
117	B1, A1, E3, D4	31.9	.21
123	B1, C2, D3, A4	33.0	.20
124	B1, C2, D3, A4	36.0	.21
126	B, D	35.1	.10
140	C, B, A, D 1	30.2	.25
177	G, D 3	41.4	.05
179	G, E, F, D	35.1	.13
183	G2, F2, E2, I3, D4	37.1	.26
Average (20 samples)		34.7	.174
Minimum		30.2	.05
Maximum		41.4	.38
Central region:	Districts E, F, and G		
158	E1	35.5	0.10
159	E2	34.5	.35
160	E	35.6	.33
161	E1, C3	34.2	.49
162	E, C	34.3	.22

TABLE 22, CONTINUED

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1969

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
163	E, C, G 1	34.8	.48
164	E, C, G, F	32.5	.28
165	E, F, C, G	35.9	.19
166	E2, G2	34.0	.36
167	E2, G2	32.9	.38
168	E, G	34.9	.38
169	E1, G3, F3	34.7	.56
170	E, G, F	33.7	.27
171	F1	36.6	.290
172	F, E	35.1	.24
173	G1	36.1	.393
174	G2	34.6	.263
175	G2	34.2	.33
176	G	34.0	.23
177	G, D 3	41.4	.05
178	G, E, F	34.1	.45
179	G, E, F, D	35.1	.13
180	G, F 3	35.9	.177
181	G3, F3, E3	39.7	.09
182	G, F, E	34.1	.41
183	G2, F2, E2, I3, D4	37.1	.26
117	B1, A1, E3, D4	31.9	.21
125	B, C, E, A	34.2	.182
141	C, E 1	34.1	.39
142	C, E	35.8	.08
143	C, E	36.0	.19
144	C, E	35.7	.343
145	C, E	39.3	.12
146	C, E	34.1	.12
147	C, E	3/ 23.3	.49
148	C, E	3/ 21.9	.43

TABLE 22, CONTINUED

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1969

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
149	C, E, A	34.8	.13
150	C, E, A	37.6	.14
151	C, E, F, G 1	34.3	.44
152	D, A, B, C, E	38.6	.09
153	D, A, B, C, E	35.7	.14
156	D, B, J, G	34.4	.16
157	D, E, G 1	40.1	.38
Average (43 samples)		34.8	.273
Minimum		21.9	.05
Maximum		41.4	.56

Rocky Mountain region: Districts H, I, J, and K

Item	Districts	Gravity	Sulfur
184	H4	41.0	0.28
185	H	36.2	.35
186	H4, I4, K4, L4	29.5	4/ 1.5
187	H, L	37.6	.20
188	H2, L2, K3	33.8	.339
189	I2	34.3	.416
190	I3	34.4	.25
191	J4	36.5	.37
192	J, N	35.3	.02
193	J, N	34.1	.15
194	K3	3/ 27.5	.64
195	K, I	38.0	.22
196	K3, M4, N4	31.0	.47
197	K, M, N	31.7	.11
156	D, B, J, G	34.4	.16
183	G2, F2, E2, I3, D4	37.1	.26
205	L, N, H, K	34.1	.376
208	N3, I4, K4	33.1	.16

TABLE 22, CONTINUED

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1969

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
Average (18 samples)		34.4	.281
Minimum		27.5	.02
Maximum		41.0	.64
Western region: Districts L, M, N, O, and P			
198	L2, M3	36.0	0.21
199	L, M	35.8	.47
200	L, M	32.3	.20
201	L, M	31.4	.28
202	L1, M, N	31.4	3/ .74
203	L2, M3, P3	33.6	.13
204	L3, N3	34.8	.03
205	L, N, H, K	34.1	.76
206	M, L	32.9	.02
207	N	33.1	.05
208	N3, I4, K4	33.1	.16
209	N4, M4	33.8	.25
210	N, M, L	36.4	.39
211	O4	38.7	.43
212	P1	40.2	.02
186	H4, I4, K4, L4	29.5	4/ 1.5
187	H, L	37.6	.20
188	H2, L2, K3	33.8	.339
192	J, N	35.3	.02
193	J, N	34.1	.15
196	K3, M4, N4	31.0	.47
197	K, M, N	31.7	.11
Average (22 samples)		34.1	.240
Minimum		29.5	.02
Maximum		40.2	.74

TABLE 22, CONTINUED

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1969

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %

Data Source: Adopted from Bureau of Mines, Mineral Industry Survey, Burner Fuel Oils, 1970

1/ District letters refer to the areas in which the fuels are sold (see fig.). The arrangement of district letters for each item indicates in decreasing order the relative volume of distribution of the fuel. Numerals following letters indicate respective volumes: 1 - over 1,500,000 barrels per year; 2 - 500,000 to 1,500,000 barrels per year; 3 - 50,000 to 500,000 barrels per year; 4 - under 50,000 barrels per year. A horizontal line separates those which are generally sold in greater volume from those sold in lesser volume in the region designated.

2/ Some sulfur determinations were made by other than ASTM D129.

3/ Does not meet the requirements of this grade.

4/ Not included in average.

TABLE 23

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1970

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
Eastern region: Districts A, B, and C			
94	A1, B1	30.1	0.34
95	A2, B1	35.3	.08
96	A3, B3	34.6	.44
97	A1, B1, D3	32.4	.06
98	B2	31.7	.11
99	B	34.7	.40
100	B, A	34.1	.33
101	B, A	33.6	.19
102	B, A	35.0	.17
103	B, A	32.1	.15
104	B1, A1, C3	32.5	.29
105	B, A, C	36.3	.15
106	B, A, C	35.6	.23
107	B1, A1, D2	32.2	.28
108	B1, A2, D2	31.0	.12
109	B, A, D	32.7	.09
110	B1, C2	35.3	.19
111	B1, C3	31.0	.26
112	B, C, A	37.2	.04
113	B, C, A	33.3	.09
114	B, C, A	36.1	.39
115	B3, C3, D3	34.0	.10
116	B1, C2, D3, A3	33.4	.35
117	B1, D1	37.6	.25
118	B, D	34.9	.08
119	B1, D1, A2	35.2	.16
120	C1	33.4	.22
121	C1	32.3	.31
122	C1	38.6	.20
123	C2	35.3	.202

TABLE 23, CONTINUED

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1970

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
124	C2	43.1	.085
125	C2	37.0	.41
126	C3	36.4	.16
127	C3	44.0	.12
128	C3	42.5	.079
129	C3	43.2	.07
130	C	42.5	.08
131	C	32.5	.25
132	C	32.6	.35
133	C	34.0	.28
134	C, E1	36.6	.36
135	C, E	31.6	.13
136	C, E	38.9	.11
137	C, E	37.5	.12
138	C, E	35.0	.455
139	C, E, A	38.1	.18
140	C, E, A	35.1	.13
141	C1, E1, F1, G1	35.0	.28
142	C, E, F, G1	37.5	.35
143	D, A, B, C, E	37.3	.08
144	D, A, B, C, E	34.0	.20
145	D1, B1	35.2	.191
146	D1, B1, C3	35.0	.20
147	D, G, B, J	34.0	.20
150	E1, C3	34.0	.49
151	E, C	34.2	.25
152	E, C, G1	35.0	.46
Average (57 samples)		35.3	.210
Minimum		30.1	.04
Maximum		44.0	.49

TABLE 23, CONTINUED

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1970

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
Southern region: District D			
143	D, A, B, C, E	37.3	0.08
144	D, A, B, C, E	34.0	.20
145	D1, B1	35.2	.191
146	D1, B1, C3	35.0	.20
147	D, G, B, J	34.0	.20
148	D1, G2, E2	39.8	.30
97	A1, B1, D3	32.4	.06
107	B1, A1, D2	32.2	.28
108	B1, A2, D2	31.0	.12
109	B, A, D	32.7	.09
115	B3, C3, D3	34.0	.10
116	B1, C2, D3, A3	33.4	.35
117	B1, D1	37.6	.25
118	B, D	34.9	.08
119	B1, D1, A2	35.2	.16
165	G, D3	40.9	.04
167	B, E, F, D	35.8	.22
Average (17 samples)		35.0	.172
Minimum		31.0	.04
Maximum		40.9	.35
Central region: Districts E, F, and G			
149	E1	34.5	.12
150	E1, C3	34.0	.49
151	E, C	34.2	.25
152	E, C, G1	35.0	.46
153	E, F, G1	35.9	.16

TABLE 23, CONTINUED

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1970

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
154	E2, G2	32.0	.44
155	E2, G2	34.2	.33
156	E, G	35.5	.40
157	E, G, F	33.0	.210
158	E, G, F	36.5	.15
159	F1	36.4	.30
160	F, E	35.3	.16
161	G1	33.7	.60
162	G3	33.9	.27
163	G3	36.0	.47
164	G	33.2	.21
165	G, D3	40.9	.04
166	G, E, F	45.1	.50
167	G, E, F, D	35.8	.22
168	G3, F3, E1	34.7	.29
169	G, F, E	33.8	.49
170	G2, F3, E3, I3	34.4	.39
134	C, E1	36.6	.36
135	C, E	31.6	.13
136	C, E	38.9	.11
137	C, E	37.5	.12
138	C, E	35.0	.455
139	C, E, A	38.1	.18
140	C, E, A	35.1	.13
141	C1, E1, F1, G1	35.0	.28
142	C, E, F, G	37.5	.35
143	D, A, B, C, E	37.3	.08
144	D, A, B, C, E	34.0	.20
147	D, G, B, J	34.0	.20
148	D1, G2, E2	39.8	.30
Average (35 samples)		35.7	.281
Minimum		31.6	.04
Maximum		45.1	.60

TABLE 23, CONTINUED

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1970

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
Rocky Mountain region: Districts H, I, J, and K			
171	H4	38.6	0.183
172	H	37.0	.254
173	H2, L2, K3	33.3	.418
174	I2	35.1	.320
175	I3	36.2	.25
176	I	31.7	.25
177	I4, K4	3/ 28.8	3/ 1.5
178	I, K	38.5	.23
179	J2	34.6	.11
180	J3, N3	34.5	.09
181	J3, N3	31.7	.15
182	K3	26.2	.51
183	K3, M4, N4	31.0	.40
184	K, M, N	35.4	.16
147	D, G, B, J	34.0	.20
170	G2, F3, E3, I3	34.4	.39
185	L, H, I, K	35.2	.18
191	L2, M3, P3, K3, D4	33.7	.06
193	L, N, H, K	35.0	.358
Average (19 samples)		33.9	.316
Minimum		26.2	.06
Maximum		38.6	1.5
Western region: Districts L, M, N, O, and P			
185	L, H, I, K	35.2	.18
186	L2, M3	36.2	.12
187	L3, M3	34.2	.40
188	L, M	32.2	.23
189	L, M	31.0	.24

TABLE 23, CONTINUED

ANALYSES OF DOMESTIC GRADE 2 BURNER FUEL OILS, 1970

Item	Districts 1/	Gravity ASTM D287, °API	Sulfur Content, 2/ ASTM D129, wt %
190	L1, M3, N3	33.1	.27
191	L2, M3, P3, K3, O4	33.7	.06
192	L3, N3	34.5	.07
193	L, N, H, K	35.0	.358
194	N2, L3	33.5	.18
195	N4, M4	33.6	.24
196	N, M, L	36.8	.42
197	N3, M3, P3	34.7	.03
198	N3, O4	33.3	.18
199	O4	39.4	.25
200	P1	38.2	.02
173	H2, L2, K3	33.3	.418
180	J3, N3	34.5	.09
181	J3, N3	31.7	.15
183	K3, M4, N4	31.0	.40
184	K, M, N	35.4	.16
Average (21 samples)		34.3	.213
Minimum		31.0	.02
Maximum		39.4	.42

Data Source: Adopted from Bureau of Mines, Mineral Industry Survey, Burner Fuel Oils, 1970

1/ District letters refer to the areas in which the fuels are sold (see fig.). The arrangement of district letters for each item indicates in decreasing order the relative volume of distribution of the fuel. Numerals following letters indicate respective volumes: 1 - over 1,500,000 barrels per year; 2 - 500,000 to 1,500,000 barrels per year; 3 - 50,000 to 500,000 barrels per year; 4 - under 50,000 barrels per year. A horizontal line separates those which are generally sold in greater volume from those sold in lesser volume in the region designated.

2/ Some sulfur determinations were made by other than ASTM D129.

3/ Does not meet the requirements of this grade.

marketing districts, figure 7, were established according to fuel distribution systems, refinery location, center of population, temperature zones, and arteries of commerce, such as navigable waters.

Each fuel sample was selected by its manufacturer as typical of their 1969 and 1970 production for specific grades and brands. The samples were analyzed by the manufacturers in accordance with recommendations of the Subcommittee on Fuel Surveys of the Petroleum Products Committee of the American Petroleum Institute. Analytical results were forwarded to the Bureau of Mines for incorporation into the report, tables 22 and 23.

By agreement with the cooperating agencies, identification of sample items is confidential. Approximately one-third of the operating refineries in 1969 and 1970 participated in the survey; 109 and 106 for the respective years. Unweighted arithmetic averages are used throughout the surveys.

The overall national downtrend in sulfur content, figure 8, continued through 1970. Regional variations in the 1969-1970 summary table are considered of only minor significance in the overall domestic trend of sulfur content in distillate fuel production. Sample analyses of the Central and Rocky Mountain Regions indicated higher arithmetic averages of sulfur content in 1970 than in 1969, and the Eastern, Southern, and Western Region samples indicated lower sulfur contents in 1970 than in 1969.

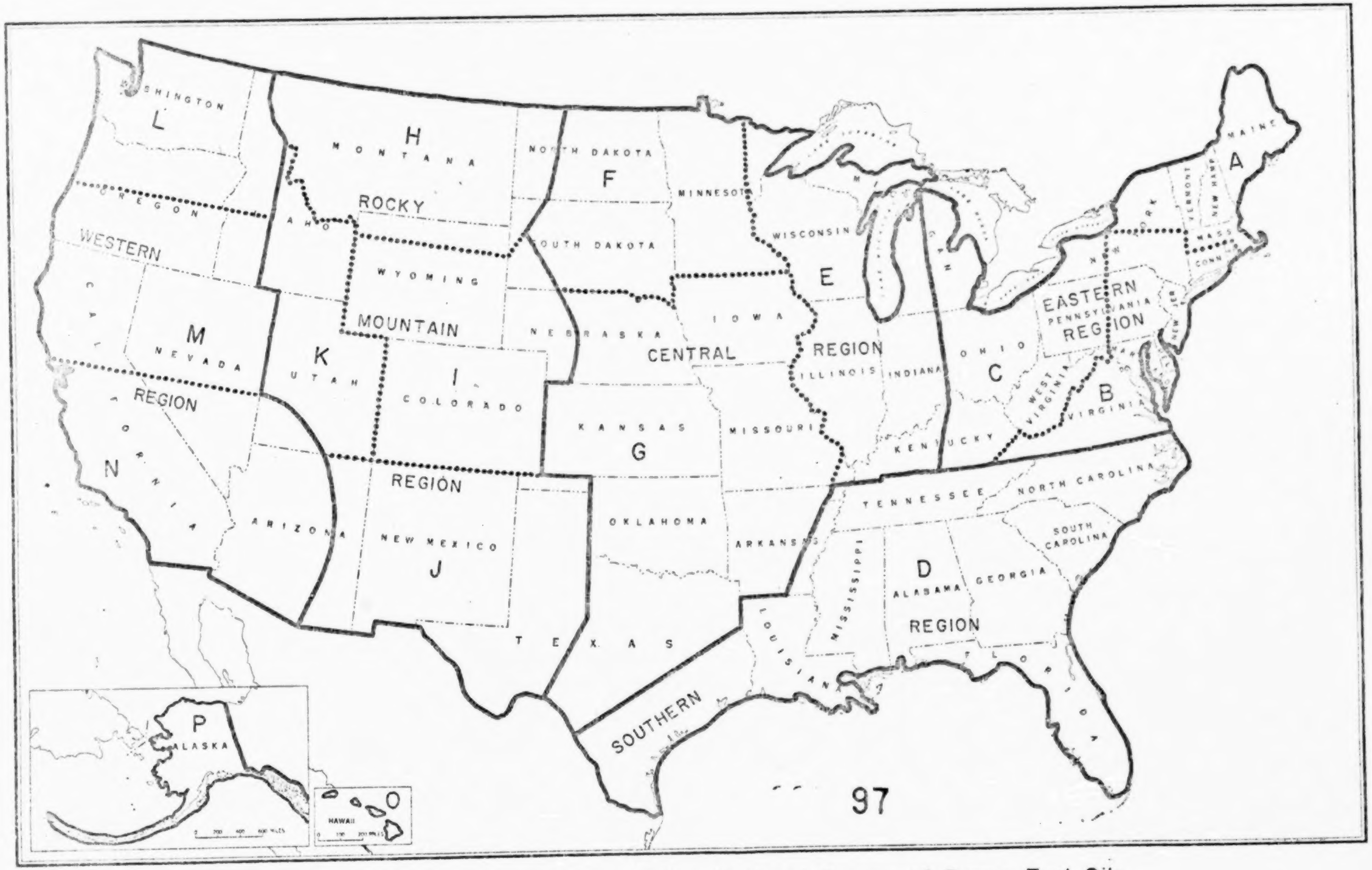
A
MAINE
VERMONT
NEW HAMP
MASS
CONN
NEW YORK
NEW JER
EASTERN REGION
PENNSYLVANIA
B
VIRGINIA
WEST VIRGINIA
C
OHIO
KENTUCKY
INDIANA
ILLINOIS
E
WISCONSIN
MICHIGAN
REGION
D
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
MISSISSIPPI
FLORIDA
REGION
F
NORTH DAKOTA
SOUTH DAKOTA
MINNESOTA
IOWA
CENTRAL
NEBRASKA
MISSOURI
G
KANSAS
OKLAHOMA
ARKANSAS
LOUISIANA
SOUTHERN
TEXAS
H
MONTANA
ROCKY
IDAHO
WYOMING
MOUNTAIN
I
COLORADO
K
UTAH
REGION
J
NEW MEXICO
ARIZONA
L
WASHINGTON
OREGON
WESTERN
M
NEVADA
REGION
N
CALIFORNIA
P
ALASKA
O
HAWAII

FIGURE 7.- Geographical Areas of the National Survey of Burner-Fuel Oils.

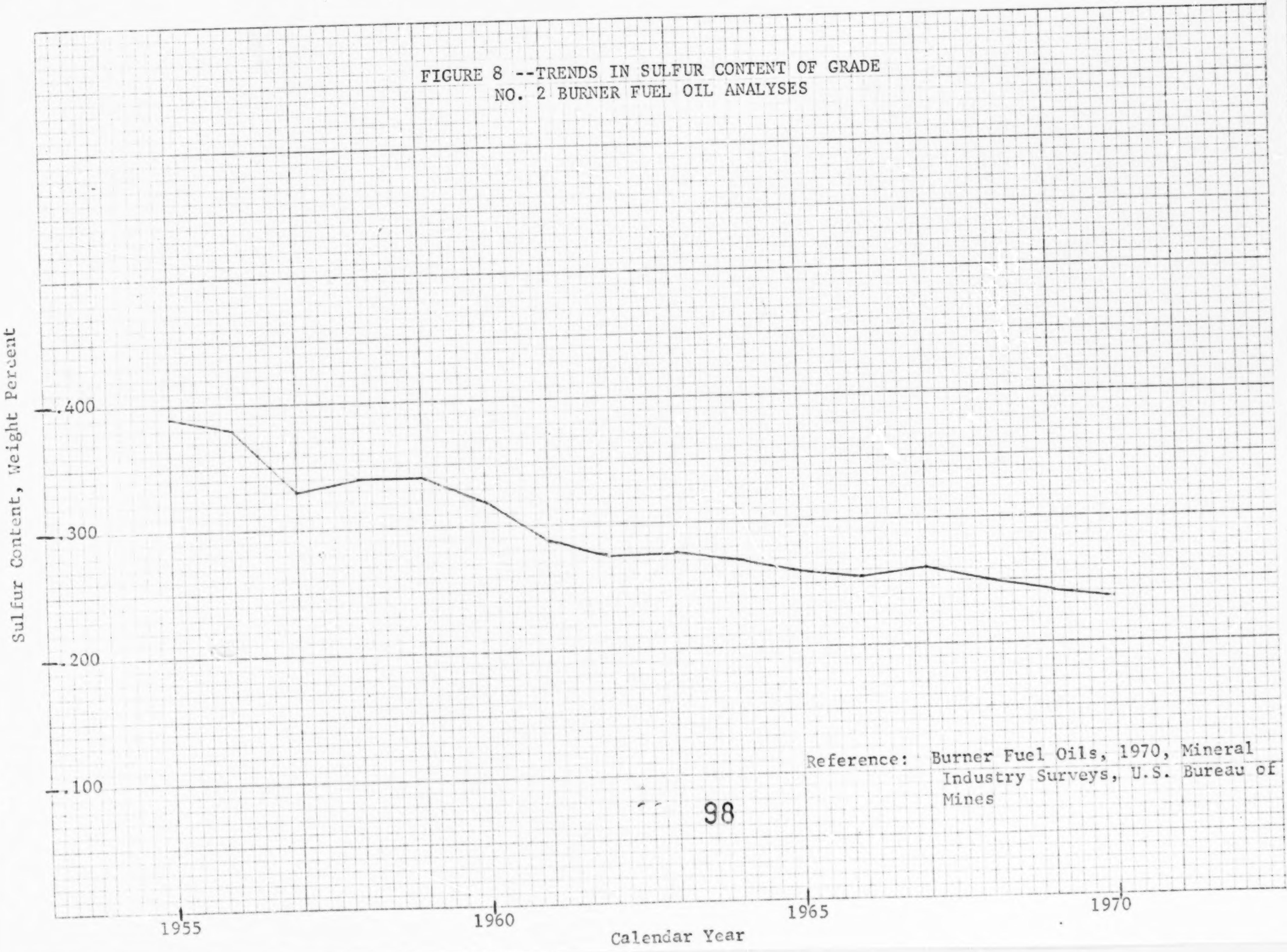

FIGURE 8 --TRENDS IN SULFUR CONTENT OF GRADE NO. 2 BURNER FUEL OIL ANALYSES

Reference: Burner Fuel Oils, 1970, Mineral Industry Surveys, U.S. Bureau of Mines

BURNING CRUDE OIL AT POWERPLANTS

The burning of low-sulfur crude oil at electric powerplants could help alleviate supply-demand deficiencies for low-sulfur residual fuel oil. However, this action constitutes an inferior use of a premium fuel.

Experience abroad, especially in Japan, has shown that crude oil can be burned efficiently in existing oil-fired boilers after modifications. Reportedly, some U.S. East Coast utilities are now converting plants to burn low-sulfur crude oil, starting in 1971. This fuel will be burned not only in steam plants, but also in gas turbines. Other power companies are planning new units that will burn either crude oil or residual fuel oil. The successful results of burning crude oil in Japanese powerplants since 1962 has encouraged this trend. In 1971 Japanese utilities will burn over 70 million barrels of crude (nearly 200,000 barrels per day). This amount will represent 24 percent of utility plant consumption or 10 percent of the total residual fuel oil consumption.

Conversion of plants from burning residual fuel oil to crude oil involves safety problems, as most low-sulfur crudes are more volatile and have lower flash points than residual fuel oil. Conversion equipment involves additional tankage and valves, in some cases these modifications could involve considerable time.

A large scale shift to burning crude oil in stationary facilities could result in insufficient quantities of naphtha and gasoline to meet demand. However, possible market-refinery adjustments in the United States would probably be minimal because, for the most part, imported crude oil would be replacing imported residual fuel oil.

More importantly, the burning of low-sulfur crude oil prior to refining is an inferior use practice which does not conform to the principals of conservation. It may be compared to using a high-grade iron ore as a road aggregate. The potential for using the high-quality hydrocarbons for the greatest economic gain literally goes up in smoke.

BULK TERMINAL STOCKS

Beginning in December 1970, supplement forms were sent with the regular monthly bulk terminal reporting form requesting sulfur information on the stocks of No. 4 and residual fuel oil only. After receipt of the monthly data it was incorporated into the computer system.

Sulfur information was reported for No. 4 and residual fuel oils. Storage of refined products at bulk terminal facilities was tabulated for distillate, No. 4, and residual fuel oils, special naphthas, and naphtha-type jet fuel, table 24. Special naphthas are finished products in the gasoline range, specially refined to specified flash point and boiling range, for use as paint thinners, cleaners, solvents, etc., but not to be marketed as motor gasoline, or used as petrochemical feedstocks. This category excludes naphtha for use as petrochemical feedstocks. Production of naphtha for petrochemical use in 1969 totaled 57.4 million barrels compared to the production of 28.4 million barrels of special naphthas. The quantity of No. 4 and residual fuel oils stored each month as summarized by sulfur levels; all the No. 4 fuel oil was on the East Coast except for a very minor amount in P.A.D. District II, table C-6. Sulfur data was not reported for P.A.D. District V in December 1970. The quantity of No. 4 fuel oil at bulk

TABLE 24. - Bulk terminal stocks of finished petroleum products, January-March 1971
(thousand barrels)

JANUARY

PAD and Refinery District	Special naphthas	Jet fuel naphtha	Distillate	Fuel oil No. 4	Residual
PAD I:					
East Coast total	645	40	45,192	2,322	17,888
Appalachian District 1	42	21	2,389	-	122
PAD II:					
Appalachian District 2	6	71	1,079	1	338
Indiana, Ill., Ky., etc.	338	147	9,374	21	1,952
Minn., Wisc., N. Dak., S. Dak.	60	50	4,908	-	309
Okla., Kans., Mo., etc.	6	216	3,062	-	-
PAD III:					
Texas Inland	-	31	480	-	-
Texas Gulf	1	-	1,810	-	793
Louisiana Gulf	20	-	441	-	160
Ark., Inland La., etc.	47	75	606	-	-
New Mexico	-	20	77	-	-
PAD IV:					
Rocky Mountain	-	9	499	-	-
PAD V:					
West Coast	157	108	6,874	-	4,727
Total	1,322	788	76,791	2,344	26,289

TABLE 24. - Bulk terminal stocks of finished petroleum products, January-March 1971--Continued
(thousand barrels)

MARCH

PAD and Refinery District	Special naphthas	Jet fuel naphtha	Distillate	Fuel oil No. 4	Residual
PAD I:					
East Coast total	912	119	28,737	2,038	18,310
Appalachian District I	38	20	1,672	-	76
PAD II:					
Appalachian District 2	11	44	844	1	336
Indiana, Ill., Ky., etc.	278	97	6,828	3	1,605
Minn., Wisc., N. Dak., S. Dak.	31	49	3,939	-	329
Okla., Kans., Mo., etc.	2	89	2,905	-	-
PAD III:					
Texas Inland	-	24	448	-	-
Texas Gulf	1	-	1,018	-	387
Louisiana Gulf	10	-	398	-	131
Ark., Inland La., etc.	36	93	450	-	-
New Mexico	-	22	99	-	-
PAD IV:					
Rocky Mountain	-	13	765	-	-
PAD V:					
West Coast	103	117	5,371	-	3,873
Total	1,422	687	53,474	2,042	25,047

TABLE 24. - Bulk terminal stocks of finished petroleum products, January-March 1971--Continued
(thousand barrels)

FEBRUARY

PAD and Refinery District	Special naphthas	Jet fuel naphtha	Distillate	Fuel oil No. 4	Residual
PAD I:					
East Coast total------------------	927	115	34,792	2,118	14,225
Appalachian District 1------------	39	-	2,167	-	88
PAD II:					
Appalachian District 2------------	8	68	1,006	1	340
Indiana, Ill., Ky., etc.----------	327	98	8,646	4	1,531
Minn., Wisc., N. Dak., S. Dak.----	45	58	4,197	-	321
Okla., Kans., Mo., etc.-----------	4	192	2,583	-	-
PAD III:					
Texas Inland----------------------	-	37	495	-	-
Texas Gulf------------------------	1	-	1,017	-	541
Louisiana Gulf--------------------	15	-	510	-	239
Ark., Inland La., etc.------------	37	94	563	-	-
New Mexico------------------------	-	38	100	-	-
PAD IV:					
Rocky Mountain--------------------	-	18	549	-	-
PAD V:					
West Coast------------------------	119	50	6,327	-	4,563
Total-----------------------------	1,522	768	62,952	2,123	21,848

terminals each month during the first quarter of 1971 averaged 2.2 million barrels. Amounts contained in the four sulfur categories were quite varied from month to month; for example, the percent in the 0 to 0.5 class each month varied from a high in January of 38 percent (737,000 barrels) to a low of 19 percent (442,000 barrels) in March. The Middle Atlantic States held the largest quantity with between 74 and 81 percent of the East Coast total each month.

Residual fuel oil held at bulk terminals averaged 23.7 million barrels each month during the first quarter of 1971. The average monthly stocks in the 0 to 0.5 percent sulfur category was 2.8 million barrels, and in the greater than 2.0 percent category was 9.6 million barrels. Over 60 percent of residual fuel oil each month was on the East Coast and the major part of this was in the Middle Atlantic area.

It should be noted that in many areas products held at bulk terminals contain an unknown quantity of imported refined products. To obtain the quantity of imported refined products held at bulk terminals would require a separate survey of the terminals. It would also be necessary to ascertain if companies distinguish foreign inventories from domestic produced products in these storage facilities. Those terminals near ports of entry are utilized for storage of imported products unless the products are held in bond. No distinction is made between imported and domestic products held at bulk terminal facilities; therefore, an unknown portion of the reported products are imports. This makes it impossible to relate domestic shipments of products with those held at bulk terminal storage facilities.

COMPARISONS

With only four months of sulfur data for fuel oils and refinery data restricted to one month from each quarter in 1970, few comparisons were attempted. All comparisons were confined to using each month with no projections outside the factual data presented for that month. The size of refineries based upon distillation throughput of crude oil, fuel oil shipments and sulfur content of fuel oils were the variables used in attempting to find meaningful relationships.

The quantity of residual fuel oil shipped from refineries during the first quarter of 1968 was 76.9 million barrels and 89.5 million barrels in 1971, table 25.

TABLE 25. - Monthly residual fuel shipments

(Million barrels)

Month	1968	1969	1970	1971
January	27.7	27.9	26.0	32.2
February	24.5	25.1	23.9	29.6
March	24.7	25.3	23.6	27.7
First quarter total	76.9	78.3	73.5	89.5
Total for year	275.8	265.9	257.5	--

Assuming a constant relationship between sulfur level and quantity shipped, the 1969 first quarter shipments of 78.3 million barrels should have had 30.8 million barrels with less than 1 percent sulfur. In 1970, the 73.5 million barrels shipped during the first quarter should have had 28.9 million barrels in the same category. When the quantity by by sulfur levels for residual fuel oil is complete for the year 1971, analysis of shipments by quantity, area, sulfur level, and previous years will be possible. Applying the same average percentage, 0.39, to the total 1970 residual fuel oil shipments of 257.5 million barrels would indicate 101.2 million barrels with less than 1 percent sulfur.

An attempt was made to ascertain the residual fuel oil output in relation to the size of refinery, based upon distillation capacity, and the percent of residual fuel oil shipments in each category, table C-1. Of the January 1971 residual fuel oil shipments of 32.2 million barrels, the largest quantity, 27.0 percent, came from 12 refineries in the over 200,000 barrel per calendar day size. It should be noted that this category with the greatest quantity of residual fuel oil shipments also has the largest cracking and reforming capacity. The February and March 1971 summations show the same relationships and the percentage in each group remains relatively constant for each month during the first quarter of 1971. It would appear that 12 refineries are shipping between 25 and 30 percent of the residual fuel oil each month and the larger refineries, capacities in excess of 50,000 barrels per calendar day, are shipping over 60 percent of the residual fuel oil each month.

No. 4 fuel oil shipments were relatively small in comparison to shipments of residual fuel oil or other distillates; however, of the 3.8 million barrels shipped in the first quarter of 1971 the 0 to 0.5 percent sulfur category contained 2.9 million barrels or 76 percent. Relation of No. 4 fuel oil shipments from refineries and stocks held at bulk terminal facilities in the lowest sulfur category was not evident from the data. Monthly comparison of No. 4 fuel oil held at bulk terminals and shipments from refineries indicated a maximum of 38 percent in the 0 to 0.5 sulfur category at the bulk terminals while shipments averaged 77 percent in the same category. The reason for the wide difference is unknown and additional data for 1971 may alter the results to a closer relationship. Sulfur content of No. 4 fuel oil imports may influence the quantity at the terminals.

Table 26 summarizes the capacity, crude oil input, and output of distillate and residual fuel oils of refineries by refinery and P.A.D. Districts. Average U.S. operating ratio was 90.4 percent in 1969. The percent of yield of residual fuel oil from input of crude oil and unfinished oils was lowest, 3.4 percent, in P.A.D. District III.

Table 26.--Salient Statistics on Refinery Operatic
(Thousand barrels per day unless othe

Districts	[1]Average crude oil throughput capacity (1)	Crude oil runs to stills (2)	Operating ratio Col.(2) ÷ Col.(1) (percent) (3)	[2]Crude and unfinished oils reruns (4)	Ref Ou (
P.A.D. I					
East Coast	1,329.5	1,175.9	88.4	1,351.5	3
Appl. #1	147.0	135.4	92.1	138.8	
Total	1,476.5	1,311.3	88.8	1,490.3	3
P.A.D. II					
Appl. #2	68.0	62.5	91.9	63.1	
Ind.-Ill.	1,995.2	1,867.8	93.6	1,861.7	3
Minn.-Wis.	218.9	198.4	90.6	198.4	
Okla.-Kans.......	937.0	884.1	94.3	887.3	2
Total	3,219.1	3,012.8	93.6	3,010.4	6
P.A.D. III					
Texas Inland	398.3	388.1	97.4	386.1	
Texas Gulf	2,782.7	2,406.8	86.5	2,322.7	5
La. Gulf	1,341.1	1,285.4	95.8	1,266.6	2
Ark.-La. Inland .	172.6	144.3	83.6	147.7	
N. Mexico	42.3	38.9	92.0	38.9	
Total	4,736.9	4,263.5	90.0	4,162.1	9
P.A.D. IV	422.0	385.3	91.3	386.4	
P.A.D. V	1,874.6	1,657.5	88.4	1,673.3	2
U.S.	11,729.1	10,630.4	90.4	10,722.4	2,3

Note: Detail may not add to totals due to independent rounding.

[1] Represents the average of the January 1, 1969 and January 1, 1970 crude-c

[2] Represents the sum of crude runs to stills plus the net input or minus th

ery Operations and Fuel Oil Output: 1969
unless otherwise stated)

de and inished reruns (4)	Distillate fuel oil: Refinery Output (5)	Distillate fuel oil: Yield Col.(5) ÷ Col.(4) (percent) (6)	Residual fuel oil: Refinery Output (7)	Residual fuel oil: Yield Col.(7) ÷ Col.(4) (percent) (8)
51.5	341.0	25.2	103.3	7.6
38.8	33.8	24.4	12.5	9.0
90.3	374.8	25.2	115.8	7.8
63.1	14.0	22.3	5.0	7.9
61.7	372.3	20.0	118.4	6.4
98.4	48.5	24.4	16.1	8.1
87.3	214.3	24.2	16.0	1.8
10.4	649.1	21.6	155.5	5.2
86.1	66.8	17.3	11.8	3.1
22.7	585.1	25.2	98.8	4.3
66.6	296.8	23.4	30.6	2.4
47.7	35.1	23.8	7.1	4.8
38.9	7.2	18.6	0.9	2.3
62.1	991.0	23.8	149.2	3.4
86.4	94.0	24.3	27.9	7.2
73.3	211.2	12.6	280.2	16.7
722.4	2,320.2	21.6	728.5	6.8

1970 crude-oil throughput capacity of operating refineries.
or minus the net output of unfinished oils.

CHAPTER 3.--REFINERY TECHNOLOGY

DOMESTIC RESIDUAL FUEL OIL DESULFURIZATION FACILITIES

Desulfurization of the heavier fuel oils has become a matter of necessity, not of economic choice. Refiners confronted with the task of providing a low-sulfur residual fuel oil from a high-sulfur crude oil supply must decide between the direct and indirect methods of desulfurization. The direct method involves reactor processing of a topped or reduced crude oil such as a residuum from an atmospheric distillation unit. The indirect approach involves desulfurization in a reactor of a gas-oil from the vacuum distillation unit (vacuum gas-oil) and blending the reactor effluent with residuum from either the atmospheric unit or the vacuum unit. No refineries in the United States are known to be employing the direct method. Several refineries on the East Coast and Gulf Coast are believed to be desulfurizing heavy gas-oil for the purpose of reducing the sulfur content of residual fuel oil by blending.

As an outgrowth of years of research, there are now new processes for desulfurizing gas-oils and residual by either of the two methods. New and more active catalysts have given the refiners a means to reduce the sulfur content of different refinery streams. Some mild hydrotreating processes are used primarily to remove foul smelling mercaptans (a group of organic sulfur compounds) and other sulfur compounds from distillate fractions, however, these processes have not been economically feasible for removing heavier sulfur compounds.

Severe reactor conditions--i.e., higher pressures, higher temperatures, more hydrogen, and more catalyst can reduce the sulfur content of a vacuum gas-oil by as much as 85 percent. This provides a stock suitable for blending with rather high-sulfur atmospheric or vacuum residuum to produce a low to medium sulfur content fuel oil. In some instances, No. 2 heating oil is substituted for desulfurized vacuum gas-oils for blending with a high-sulfur residual.

An advantage of the blending (indirect) route is that most refineries already have distillate hydrodesulfurization (hydrotreating) facilities used for desulfurizing the lighter gas-oils for diesel oil production. In addition, refineries with catalytic cracking facilities generally desulfurize the charge in order to reduce catalyst degeneration. Blending, however, has limited effectiveness because during the distillation of crude oil the sulfur compounds tend to concentrate in the heavier fractions. Accordingly, on the average, about two-thirds of the sulfur in a barrel of oil charged to an atmospheric distillation unit will be contained in the atmospheric residuum. As reported in The Oil and Gas Journal, U.S. refineries at yearend 1970 had hydrotreating capacity of 4,344,450 barrels per day. Essentially, all of this desulfurization capacity was employed in the removal of contaminants from a variety of fuels and products other than residual fuel oil. Presumably, with refinery adjustments in feedstock, and alterations in refinery flow patterns, additional desulfurization of residual fuel oil by blending could be accomplished.

Several direct residual hydrodesulfurization units have recently been completed in Japan. One of these employs a process licensed by

Gulf Research and Development Co., and has operated successfully since January 1970. This unit is part of the Mizushima refinery of Nippon Mining Co., located near Osaka. It can lower 27,760 b/sd of Kuwait atmospheric residuum from 4 percent sulfur to 1 percent. The key to the process is a catalyst which remains active after long periods of use even though large quantities of vanadium and nickel were deposited on it. It is not practical to regenerate the catalyst, but fortunately the catalyst is relatively inexpensive and can be replaced after a single cycle. Gulf Oil plans to install another such unit in its Okinawa refinery.

Planned U.S. residual desulfurization facilities, shown in table 27, will provide a total additional residual desulfurization capacity of 345,000 barrels per stream day of approximately 1 percent sulfur heavy fuel sometime in 1971.

FOREIGN RESIDUAL FUEL OIL DESULFURIZATION FACILITIES

Facilities for desulfurizing residual fuel oil at foreign refineries are concentrated in three areas; Japan, the Caribbean area, and the Persian Gulf area. The first foreign residual fuel oil desulfurization unit was built in Japan in 1967. It was built to process residual products from high-sulfur Middle East crude oil. With the passage of air quality legislation in Japan that year, plans for other desulfurization facilities proliferated. Because of the increasing difficulty in marketing high-sulfur Kuwait and Neutral Zone crude, two plants were built in Kuwait, the former an all-hydrogen refinery. Since the establishment of air quality standards in metropolitan areas of the

TABLE 27. - Proposed U.S. residual desulfurization facilities

Company, location	Capacity (b/sd) and processing route	Approx. output of 1%-sulfur heavy fuel	Licensor	Estimated completion date	Estimated cost
Fuel Desulfurization New York City	130,000 Direct	100,000	Hydrocarbon Research, Inc.	late-1971	$110 million
Guardian Oil New York City	125,000 Direct	95,000	Chevron Research Co.	1971	50 million
Supermarine New York City	65,000 Direct	50,000	Chevron Research Co.	--	46 million
Steuart Refining Co. Piney Point, Md.	135,000 Direct and Indirect	100,000	--	--	60 million

Source: Oil and Gas Journal, Vol. 67, No. 28, July 14, 1969, p. 30.

United States, four plants have been built in the Caribbean to process products from high-sulfur Venezuelan crude (or a blend of Venezuelan and African) for export primarily to the United States. At the end of 1970 the capacity of all foreign facilities built to lower the sulfur content of residual fuel oil was 720,260 barrels per day. Known plants under construction at that time totaled 326,500 barrels per day. Data on each plant are given in table 28.

Over half (54%) of the foreign capacity in operation is at Japanese refineries. All of the output from these units is marketed in Japan and presumably not readily available for exportation. Although specific data are not available, most of the output from the Persian Gulf facilities is believed to be shipped to Japan, whereas that from the Caribbean plant is exported to the United States.

Expansion plans include the construction of four plants in the Caribbean area by 1972 having a combined capacity of 215,500 barrels per day. When completed Caribbean desulfurization plants will have a total capacity of 483,500 barrels per day.

For the most part capacity of direct residual fuel oil desulfurization units means the maximum rate at which high-sulfur residual fuel oil (as high as 6.3% sulfur) can be desulfurized to 1% S. No foreign scheme reduces the sulfur content level to less than 1% S using the direct method.

Indirect processing capacities are the maximum rate at which vacuum gas-oil may be desulfurized prior to blending with high-sulfur residual fuel oil. The sulfur level of the vacuum gas-oil desulfurized varies

TABLE 28. - Foreign residual fuel oil desulfurization facilities, yearend 1970
(Capacities in barrels per day)

Country Company	Refinery location	Year completed	Capacity1/	Process	Company	Comments
			Completed			
Japan						
Idemitsu Kosan	Chiba	1967	40,000	Direct	RCD-UOP	Lowers 4.0% S resid. to 1.0% S resid.
Fuji Sekiyu	Sodegaura	1968	23,000	Indirect	Isomax	For the most part, the capacities of these units reflect their ability to produce a desulfurized gas-oil with about 0.3 to 0.5% S content which is blended with a variety of vacuum resid. to meet the Japanese average of 1.7% S.
Toa Nenryo Kogyo	Wakayama	1968	25,000	do	ER & E	
Nihan Sekiyu Seisei	Negishi	1969	40,000	do	CRC Isomax	
Daikyo Sekiyu	Umaokoshi	1969	35,000	do	Gulfining	
Kyushu Sekiyu	Oita	1969	14,000	do	UOP Isomax	
Showa Sekiyu	Kawasaki	1969	14,000	do	Shell HDS	
Mitsubishi Sekiyu	Mizushima	1969	30,000	do	UOP Isomax	
Maruzen Sekiyu	Chiba	1969	35,000	do	Unicracking	
Seibu Sekiyu	Yamaguchi	1969	4,000	do	Shell HDS	
General Sekiyu Seisei	Sakai	1970	31,000	do	ER & E	
Koa Sekiyu Seisei	Marifu	1970	8,000	do	CRC Isomax	
Nihan Kogyo	Mizushima	1970	27,760	Direct	Gulf HDS	Lowers feedstock from 4% S to 1% S resid.
Kashima Sekiyu	**Kashima**	1970	45,000	Direct	RCD-UOP Isomax	Do.
Daikyo Sekiyu	Umaokoshi	1970	17,500	NA	NA	NA
Subtotal			389,260			
Kuwait						
Kuwait National Oil Co.	Shwaiba	1968	28,000	Direct	H-Oil-Hydro Carb. Res.	Feed is heavy oils from vacuum unit. Output is a wide range of products. Resid. output is 11,810 b/d of 2% which can be mixed with heavy gas-oil from other units. Called all hydrogen refinery.
American Independent Oil Co.	Mena Abdulla	1969	35,000	Direct	Isomax	Lowers crude bottoms (resid.) of as high as 6.3% S to less than 1% S.
Subtotal			63,000			

TABLE 28. - Foreign residual fuel oil desulfurization facilities, yearend 1970--**Continued**
(Capacities in barrels per day)

Country Company	Refinery location	Year completed	Capacity[1]	Process	Company	Comments
			Completed			
Venezuela						
Creole Petroleum Corp.	Amuay	1970	143,000	Indirect	ERE	Two units each 71,500 b/d. Not sufficient VGO to operate at capacity. In 1970 was operating at 80%. This will continue until other units are completed. Present output is 0.2% S gas-oil which is blended with 3.1% S resid. from the vacuum gas-oil unit. Resid. output could (in 1970) reach 160,000 b/d of 1% S or 100,000 b/d of 1% S and 50,000 b/d of .3% S.
Cie. Shell deVenezuela, Ltd.	Cardon	1969	35,000	Indirect	Shell-HDS	Can remove up to 80% of the sulfur in the VGO. Feed is VGO, atmosphere distillate or furfural extr. with a S content of 2.1 by weight. Can produce desulfurized distillate of 0.3% Sat 35,000 b/d.
Subtotal			178,000			
Netherlands West Indies						
Shell Curacao, N. V.	Curacao	1967	30,000	Indirect	Shell-HDS	Feed is VGO of about 2.0% S, produces 30,000 b/d of 0.3% S gas-oil.
Virgin Islands						
Hess Oil Co.	St. Croix	1969	60,000	Indirect	NA	Feed is vacuum gas-oil VGO of 1.2% S. Output is 0.1% S gas-oil which is mixed with vacuum resid. or atmospheric resid. Blending schedules are not available.
Total completed			720,260			

TABLE 28. - Foreign residual fuel oil desulfurization facilities, yearend 1970--Continued
(Capacities in barrels per day)

Country Company	Refinery location	Year completed	Capacity[1]	Process	Company	Comments
			Under construction			
Trinidad						
Texaco Trinidad, Inc.	Pointe-a-Pierre	1972	77,000	Indirect	NA	NA
Netherlands West Indies						
Lago Oil and Transport Co.	Aruba	1971	80,000	Indirect	NA	Product to be charged is 2.0% S VGO. Resid. output is reported at 75,000 b/d of 1.0% S and 13,000 b/d of 0.3% S.
Bahamas						
Bahama Oil Refining Co.	Freeport	1972	40,000	Indirect	NA	NA
Mexico						
Petroleos Mexicanos (Pemex)	Salamanca	1972	18,500	Direct	HRI	NA
Japan						
Idemitzu Kosan	Himeji	1971	40,000	Direct	UOP	NA
Kansai Sekiyu	Sakai	1971	20,000	Indirect	NA	NA
Koa Sekiyu	Osaka	1971	12,000	Indirect	NA	NA
Toa Nenryo Kogyo	Kawasaki	1971	35,000	Indirect	NA	NA
Kyokuto Sekiyu Kogyo	Chiba	1972	40,000	Direct	NA	NA
Subtotal			147,000			
Total under construction			362,500			

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[1] For the most part, capacities are believed to be the throughput capacity of the process unit.

from 0.1% to 0.3%. Output sulfur levels vary according to the sulfur content of the charge. The sulfur content of the residual/gas-oil mix depends on specifications of the purchaser.

CHAPTER 4.--RESIDUAL FUEL OIL IMPORTS, 1968 and 1969

Residual fuel oil data gathered by OAP from the Office of Import Administration (O. I. A.) for the years 1968 and 1969 were made available to the Bureau of Mines. These data were entered in the data bank. Summations of these imports were made by port of entry (Table C-9 and C-10) and country of origin (Table C-11 and C-12) for each year. Included in the residual fuel oil imports is about 27.4 million barrels of No. 4 fuel oil in 1969 and 19.1 million in 1968.

Currently information on residual and No. 4 fuel oils for 1970 and 1971 is being collected by the Bureau of Mines. As each month is completed the data will be entered in the data bank. When data are complete for January 1970 through June 1971, a supplemental report will be prepared by the Bureau of Mines covering imports of residual fuel oils by sulfur levels for the three and a half year period.

Imported fuel oil predominately contained over one percent sulfur. In 1969 all the lowest sulfur fuel oil went to the east coast and came primarily from Europe (Tables C-10 and C-12). Less than one percent (2,301,440 barrels) was in the less than 0.3 percent category and 54 percent (236,859,398 barrels) contained over two percent sulfur. The quantity of low sulfur residual fuel oil imports, less than 0.51 percent, declined from 16 million barrels in 1968 to 12 million barrels in 1969.

CHAPTER 5.--CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Of the total API petroleum reserve of 29.6 billion barrels at the end of 1969, sulfur data was obtained for 19.7 billion barrels and the 1969 crude oil production was 3.2 billion barrels. Distribution of the production, figure 9, to refineries and the quantities of products manufactured is a measure of the magnitude of the petroleum industry in the United States. Sulfur content in the various components of this industry is an environmental problem. Factual data concerning this sulfur contents were the primary justifications for this report and continued surveillance will be required for better and more meaningful interpretations in the future.

Based on a study of the sulfur content of 67 percent of the API reserve (as of December 31, 1969), the remaining 33 percent of the reserve was apportioned to four sulfur content ranges. The classification of the total reserve was as follows: 18,908 million barrels, 0 to 0.5 percent; 3,499 million barrels, 0.51 to 1.00 percent; 5,151 million barrels, 1.01 to 2.00 percent; and 2,074 million barrels, greater than 2.00 percent. Based on 80 percent of the 1969 production, classification of total U.S. production was as follows: 2,243 million barrels, 0 to 0.5 percent; 362 million barrels, 0.51 to 1.00 percent; 337 million barrels, 1.01 to 2.00 percent; and 247 million barrels, greater than 2.00 percent. Reserve estimates made by the Bureau of Mines for over 1,000 fields are available to government agencies by

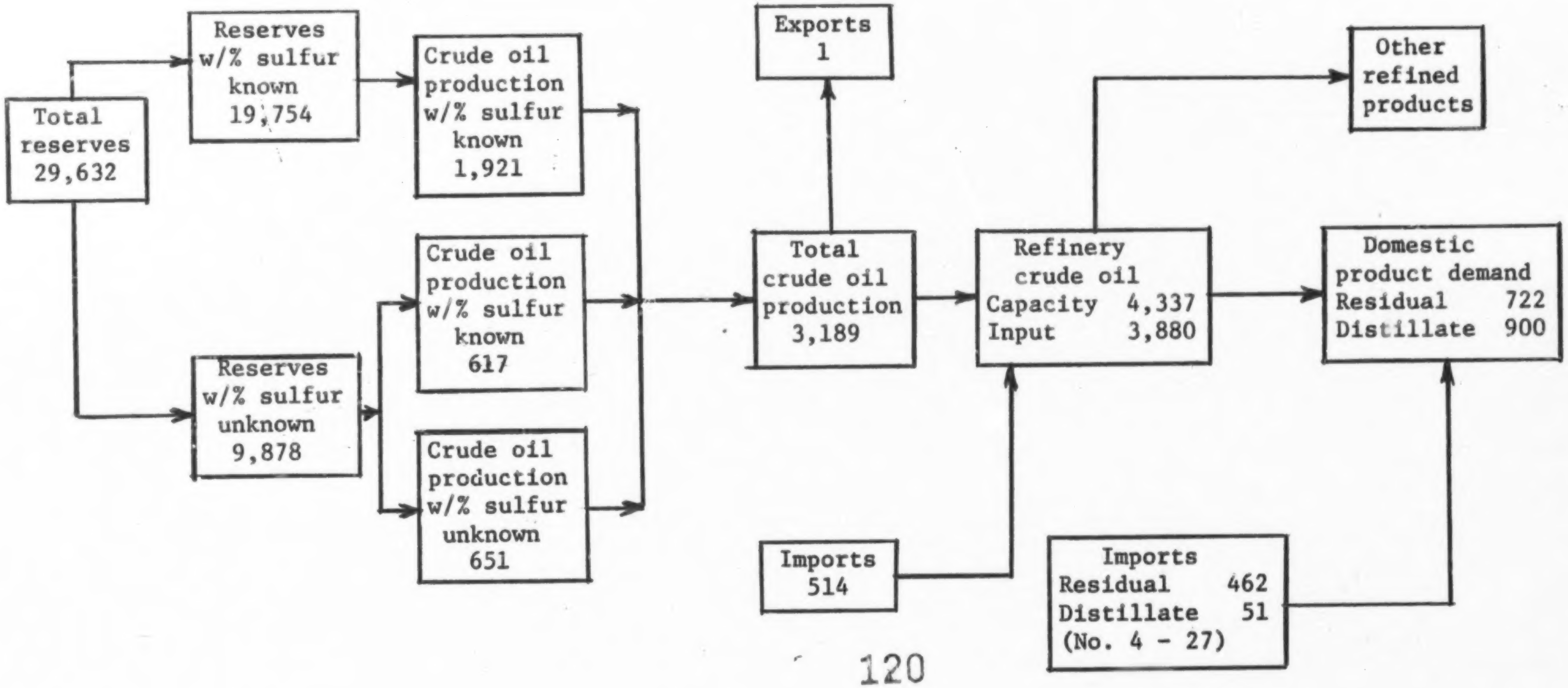
Total reserves 29,632
Reserves w/% sulfur known 19,754
Reserves w/% sulfur unknown 9,878
Crude oil production w/% sulfur known 1,921
Crude oil production w/% sulfur known 617
Crude oil production w/% sulfur unknown 651
Exports 1
Total crude oil production 3,189
Imports 514
Refinery crude oil
Capacity 4,337
Input 3,880
Other refined products
Domestic product demand
Residual 722
Distillate 900
Imports
Residual 462
Distillate 51
(No. 4 - 27)

FIGURE 9. - Flow diagram--reserves to products--1969

(Million barrels)

Few refineries ship or keep stocks of No. 4 fuel oil. In the first quarter of 1971 shipments were 3.8 million barrels and stocks averaged about 1.4 million barrels each month. Over 75 percent of the No. 4 shipments were in the 0 to 0.5 percent sulfur category.

No. 4 and residual fuel oils stored at bulk terminal facilities averaged 2.2 and 23.7 million barrels each month, respectively, during the first quarter of 1971. In the 0 to 0.5 sulfur range were 0.6 million barrels of No. 4 fuel oil and 2.8 million barrels of residual fuel oil each month. Bulk terminal storage facilities include unknown quantities of imported refined products.

Based upon three months sulfur data, the first quarter of 1971, no meaningful conclusions covering past or future sulfur content of No. 4 residual fuel oil can be made. At least one full year of sulfur information will be required before trends or projections can be determined.

The sulfur content in crude oil run through a refinery bears no direct relation to the sulfur content in distillate or residual fuel oil outputs from that refinery. Many variables in refinery processing cause products with variable sulfur content. Crude oil containing 0.3 percent sulfur may concentrate in the refinery process and result in residual fuel oil with 1.5 to 2.0 percent sulfur at a particular refinery. Another refinery may use crude oil with 0.3 percent sulfur and manufacture residual fuel oil with over 3.0 percent sulfur. In no case will sulfur content of manufactured residual fuel oil be less than the sulfur content of the crude oil used to make that residual fuel oil unless some type of desulfurization process is used. Blending is another method of reducing sulfur content of residual fuel oil.

Blending of various products of distillates and residual fuel oil is the technique practiced by most companies to meet their customers' specifications. Generally blending takes place at the storage facility and occurs when filling a particular order with specifications of type, sulfur content, quantity, etc. The Bureau of Mines receives no data relating to blending of products.

During the course of this study certain information desired by OAP was not available and resulted in data gaps. Notable among these are the lack of data sulfur content of refinery receipts of domestic and foreign crude oils, breakdown of inventories by domestic and foreign sources, consumption data of fuel oils by sulfur content, inventory data fuel oils at the state or smaller geographic level, and the price and sulfur content of crude oil refinery feedstocks. To obtain any of this information would require canvassing of the industry.

RECOMMENDATIONS

It is recommended that: (1) coverage (of this study) be expanded to include all fields (or reservoirs) with crude oil production of 100,000 barrels per year or more, and fields be added as production exceeds this lower limit; (2) crude oil analysis be made for above fields for which no sulfur content data are available; (3) all field reserve estimates with sulfur content be re-evaluated at least every three years;

and (4) sulfur content be determined for major potential crude oil production (Alaska North Slope) and for other possible sources such as oil shale (Rocky Mountain area) and tar sands (Missouri and Kansas). Expansion will be determined by availability of funds and personnel.

The Bureau of Mines will continue to collect sulfur data for No. 4 and residual fuel oil and, when feasible, request sulfur data for other refined products which could have an impact upon environmental conditions such as other distillates or naphtha. Selection of other products, if any, to be under joint agreement of the Bureau of Mines and Office of Air Programs based upon need, funds and personnel.

Updating of the national energy data bank by the Bureau of Mines will be continued. Future data bank additions deemed useful for both the Bureau of Mines and other government agencies include: (1) expansion of sulfur content data; (2) calculate additional crude oil reserves; (3) other elements or compounds which may be environmental factors such as nitrogen, vanadium, mercury, nickel, etc.; (4) expansion when possible will include data on natural gas, condensate, and other refined products.

After the end of 1971 when one full year of sulfur data will be in the data bank for No. 4 and residual fuel oils, these data will be made available upon request of other government agencies.

To increase the supply of low sulfur residual fuel oil in the United States several actions could be taken, included in these are: (1) increase imports of low sulfur residual fuel oil; (2) increase production of domestic low sulfur residual fuel oil by desulfurization; (3) increase refinery feedstocks or use of low sulfur crude oils; (4) increase imports of lower sulfur crude oil from which residual fuel oil could be manufactured.

APPENDIX A.--GLOSSARY

Alkylation--Process by which light, volatile hydrocarbons having two to four carbon atoms that have high octane numbers are brought into chemical combination forming heavier compounds called alkylates.

Barrel--A volumetric unit of measurement equivalent to 42 U.S. gallons. (A.G.I.)

Barrels per calendar day--Throughput or output of a unit operating for a full day (24 hours) with a prorated allowance for regular "downtime" on a unit for routine maintenance and repair.

Blending--Mixing in predetermined and controlled quantities to give a uniform product.

Bulk terminal--All bulk installations which receive their principal products by tankers, barges, or pipelines, or any other storage point with a combined capacity of 50,000 barrels or more, regardless of the transportation means by which products are received.

Catalyst--A substance capable of changing the rate of reaction without itself undergoing any net change.

Cracking--Refinery process in which relatively heavy hydrocarbons (such as fuel oils and naphthas from petroleum) are broken up into lighter products (such as gasoline and ethylene) by means of heat, and usually pressure, and sometimes catalysts.

Crude oil analysis--A quantitative statement of the experimentally determined physical and chemical characteristic of oil.

Crude petroleum--A naturally occurring mixture, consisting predominately of hydrocarbons, and/or sulfur, nitrogen, and/or oxygen derivatives of hydrocarbons, which is removed from the earth in liquid state or capable of being so removed.

Desulfurization--The removal or reduction of sulfur in petroleum products.

Distillation of petroleum--Refinery process by which heat is applied to the crude oil in order that its constituents may pass off in vapor, and by suitable arrangements subsequently collected in the form of a liquid.

Energy demand--Energy demand refers to the market demand for fossil fuels such as natural gas, oil, and coal for the purpose of performing power.

Production--Crude oil production is the volume of petroleum liquid, excluding condensate, which is produced from reservoirs during given periods of time.

Production decline curve--A mathematical calculation or graphical method used to derive reserves after sufficient actual performance data have become available for a field or reservoir.

Proved crude oil reserves--Proved reserves of crude oil as of December 31, of any given year are the estimated quantities of all liquids statistically defined as crude oil, which geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions. (API)

Refinery--A multitude of integrated processing units designed and operated for manufacturing with precision a multitude of finished or semifinished products from crude petroleum.

Refinery capacity--Quantity of crude petroleum that a refinery is capable of processing in a specified period of time.

Reforming--A procedure for altering the molecules of straight-run or other naphthas by converting some non-aromatic constituents into products containing aromatic compounds.

Reserve-production ratio--Reserve-production ratio is obtained by dividing the remaining reserve at the end of the year of a given reservoir, field, or State by the corresponding annual crude oil production for the purpose of estimating reserves.

Reservoir--A reservoir is that portion of an underground trap which contains oil and/or gas; it is the common source of oil supply.

Residual fuel oil--Topped crude petroleum or viscous residium obtained in refinery operation.

Sulfur content--Sulfur content (percent of weight) is a general characteristic of crude oil and normally found in the form of organic sulfur compounds. It is derived from a crude oil sample, taken from an oil reservoir, and based on a crude petroleum analysis.

Volumetric calculations--Volumetric calculation is one of the mathematical methods used for the purpose of estimating crude oil in the reservoir.

APPENDIX B.--BUREAU OF MINES PROJECT PERSONNEL

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W. D. Dietzman, Petroleum Engineer

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W. G. Carrico, Statistical Assistant

TABLE C-1. - ESTIMATED PRODUCTION OF RESIDUAL FUEL OIL RANKED BY SIZE OF REFINERY
JANUARY 1971

CRUDE OIL THRUPUT CAPACITY (BARRELS PER DAY)	NUMBER OF REFINERIES	DISTILATION (BBLS PER DAY)	CRACKING (BBLS PER DAY)	RESIDUAL SHIPMENTS (THOUSANDS OF BBLS)	PERCENT OF TOTAL
OVER 200000	12	3404300	1619080	8694(12)	27.0
150000 TO 190000 .	7	1148300	665990	2739(6)	8.5
100000 TO 149000 .	13	1589100	837440	3501(12)	10.9
75000 TO 99999 ...	17	1439500	724350	4382(15)	13.6
50000 TO 74999 ...	23	1382800	684275	4621(20)	14.3
25000 TO 49999 ...	51	1859000	869772	4074(40)	12.6
10000 TO 24999 ...	43	704833	279067	1814(31)	5.6
5000 TO 9999	29	189150	27000	568(16)	1.8
UNDER 5000	88	160410	33170	1824(40)	5.7
TOTAL	283	11877393	5740144	32217(192)	

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-1. - ESTIMATED PRODUCTION OF RESIDUAL FUEL OIL RANKED BY SIZE OF REFINERY
FEBRUARY 1971

CRUDE OIL THRUPUT CAPACITY (BARRELS PER DAY)	NUMBER OF REFINERIES	DISTILATION (BBLS PER DAY)	CRACKING (BBLS PER DAY)	RESIDUAL SHIPMENTS (THOUSANDS OF BBLS)	PERCENT OF TOTAL
OVER 200000	12	3404300	1619080	8631(11)	29.4
150000 TO 190000 .	7	1148300	665990	2818(6)	9.6
100000 TO 149000 .	13	1589100	837440	3178(10)	10.8
75000 TO 99999 ...	17	1439500	724350	3124(15)	10.6
50000 TO 74999 ...	23	1382800	684275	3875(19)	13.2
25000 TO 49999 ...	51	1859000	869772	4396(37)	15.0
10000 TO 24999 ...	43	704833	279067	1417(31)	4.8
5000 TO 9999	29	189150	27000	522(15)	1.8
UNDER 5000	88	160410	33170	1414(32)	4.8
TOTAL	283	11877393	5740144	29375(176)	

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-1. - ESTIMATED PRODUCTION OF RESIDUAL FUEL OIL RANKED BY SIZE OF REFINERY
MARCH 1971

CRUDE OIL THRUPUT CAPACITY (BARRELS PER DAY)	NUMBER OF REFINERIES	DISTILATION (BBLS PER DAY)	CRACKING (BBLS PER DAY)	RESIDUAL SHIPMENTS (THOUSANDS OF BBLS)	PERCENT OF TOTAL
OVER 200000	12	3404300	1619080	7537(12)	28.2
150000 TO 190000 .	7	1148300	665990	2066(5)	7.7
100000 TO 149000 .	13	1589100	837440	4090(12)	15.3
75000 TO 99999 ...	17	1439500	724350	3504(16)	13.1
50000 TO 74999 ...	23	1382800	684275	3099(18)	11.6
25000 TO 49999 ...	51	1859000	869772	3212(33)	12.0
10000 TO 24999 ...	43	704833	279067	1349(30)	5.1
5000 TO 9999	29	189150	27000	442(15)	1.7
UNDER 5000	88	160410	33170	1391(35)	5.2
TOTAL	283	11877393	5740144	26690(176)	

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-2. - SHIPMENTS OF RESIDUAL FUEL OIL FROM REFINERIES BY SULFUR CONTENT
DECEMBER 1970
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	177(***)	4216(10)	749(7)	2937(12)	8079(20)
EAST COAST	120(***)	4216(10)	479(5)	2708(11)	7523(16)
APPALACHIAN NO. 1	57(***)	0(0)	270(***)	229(***)	556(6)
P.A.D. DISTRICT II	178(9)	1827(23)	3598(17)	2031(15)	7634(47)
APPALACHIAN NO. 2	0(0)	171(***)	0(0)	0(0)	171(***)
IND., ILL., ETC.	65(***)	1497(17)	3203(11)	1161(9)	5926(29)
MINN., WISC., ETC.	22(***)	72(***)	194(***)	591(***)	879(6)
OKLA., KANS., ETC.	91(***)	87(6)	201(***)	279(5)	658(16)
P.A.D. DISTRICT III	564(16)	3583(13)	846(10)	3505(27)	8498(53)
TEXAS GULF	259(6)	1485(7)	617(5)	2802(10)	5163(21)
TEXAS INLAND	25(***)	23(***)	72(***)	166(***)	286(10)
LA. GULF	138(***)	2073(***)	118(***)	359(***)	2688(10)
ARK., LA. INLAND., ETC......	110(***)	0(0)	39(***)	170(8)	319(11)
NEW MEXICO	32(***)	2(***)	0(0)	8(***)	42(5)
P.A.D. DISTRICT IV	41(***)	372(7)	184(***)	316(13)	913(22)
OTHER ROCKY MT.	41(***)	372(7)	184(***)	316(13)	913(22)
P.A.D. DISTRICT V	0(0)	0(0)	0(0)	0(0)	0(0)
WEST COAST	0(0)	0(0)	0(0)	0(0)	0(0)
TOTAL	960(31)	9998(35)	5377(25)	8789(46)	25124(87)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-2. - SHIPMENTS OF RESIDUAL FUEL OIL FROM REFINERIES BY SULFUR CONTENT
JANUARY 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	568(5)	1216(6)	710(6)	1440(9)	3934(19)
EAST COAST	518(***)	1216(6)	161(***)	1440(9)	3335(14)
APPALACHIAN NO. 1	50(***)	0(0)	549(***)	0(0)	599(6)
P.A.D. DISTRICT II	319(9)	1879(22)	2816(18)	3382(16)	8396(47)
APPALACHIAN NO. 2	0(0)	154(***)	0(0)	0(0)	154(***)
IND., ILL., ETC.	171(***)	1548(16)	2329(11)	2236(9)	6284(28)
MINN., WISC., ETC.	14(***)	73(***)	145(***)	765(***)	997(6)
OKLA., KANS., ETC.	134(***)	104(6)	342(5)	381(6)	961(17)
P.A.D. DISTRICT III	896(15)	3205(13)	487(11)	2855(29)	7443(52)
TEXAS GULF	714(6)	1692(7)	448(6)	2003(11)	4857(21)
TEXAS INLAND	18(***)	14(***)	8(***)	332(6)	372(9)
LA. GULF	59(***)	1488(***)	12(***)	331(5)	1890(11)
ARK., LA. INLAND., ETC.....	76(***)	11(***)	19(***)	143(6)	249(9)
NEW MEXICO	29(***)	0(0)	0(0)	46(***)	75(5)
P.A.D. DISTRICT IV	61(***)	358(5)	179(***)	343(12)	941(19)
OTHER ROCKY MT.	61(***)	358(5)	179(***)	343(12)	941(19)
P.A.D. DISTRICT V	3316(9)	196(***)	7991(19)	5(***)	11508(23)
WEST COAST	3316(9)	196(***)	7991(19)	5(***)	11508(23)
TOTAL	5160(36)	6854(34)	12183(33)	8025(46)	32222(94)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-2. - SHIPMENTS OF RESIDUAL FUEL OIL FROM REFINERIES BY SULFUR CONTENT
FEBRUARY 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	192(6)	615(9)	1661(9)	618(8)	3086(19)
EAST COAST	154(***)	615(9)	1117(7)	618(8)	2504(15)
APPALACHIAN NO. 1	38(***)	0(0)	544(***)	0(0)	582(6)
P.A.D. DISTRICT II	217(8)	2433(24)	2907(21)	2560(13)	8117(45)
APPALACHIAN NO. 2	0(0)	144(***)	0(0)	0(0)	144(***)
IND., ILL., ETC.	109(***)	2127(18)	2485(13)	1644(8)	6365(28)
MINN., WISC., ETC.	22(***)	68(***)	133(***)	609(***)	832(6)
OKLA., KANS., ETC.	86(***)	94(6)	289(6)	307(***)	776(16)
P.A.D. DISTRICT III	880(15)	3585(14)	802(11)	2014(17)	7281(43)
TEXAS GULF	671(5)	2182(7)	715(5)	1619(8)	5187(19)
TEXAS INLAND	34(***)	16(***)	42(***)	118(***)	210(8)
LA. GULF	78(***)	1376(***)	4(***)	185(***)	1643(8)
ARK., LA. INLAND., ETC.....	88(***)	9(***)	41(***)	88(5)	226(8)
NEW MEXICO	9(***)	2(***)	0(0)	4(***)	15(***)
P.A.D. DISTRICT IV	39(***)	327(5)	135(***)	141(7)	642(15)
OTHER ROCKY MT.	39(***)	327(5)	135(***)	141(7)	642(15)
P.A.D. DISTRICT V	3830(9)	239(***)	6421(19)	11(***)	10501(23)
WEST COAST	3830(9)	239(***)	6421(19)	11(***)	10501(23)
TOTAL	5158(37)	7199(38)	11926(39)	5344(32)	29627(84)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-2. - SHIPMENTS OF RESIDUAL FUEL OIL FROM REFINERIES BY SULFUR CONTENT
MARCH 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	780(6)	435(5)	1201(8)	616(8)	3032(18)
EAST COAST	727(***)	435(5)	634(5)	616(8)	2412(13)
APPALACHIAN NO. 1	53(***)	0(0)	567(***)	0(0)	620(6)
P.A.D. DISTRICT II	157(6)	2134(24)	1647(18)	2250(9)	6188(43)
APPALACHIAN NO. 2	0(0)	137(***)	0(0)	0(0)	137(***)
IND., ILL., ETC.	56(***)	1866(19)	1300(10)	1493(6)	4715(28)
MINN., WISC., ETC.	12(***)	78(***)	127(***)	506(***)	723(6)
OKLA., KANS., ETC.	89(***)	53(***)	220(6)	251(***)	613(13)
P.A.D. DISTRICT III	802(16)	2751(12)	778(10)	2445(24)	6776(49)
TEXAS GULF	446(***)	1213(5)	698(5)	1875(11)	4232(20)
TEXAS INLAND	23(***)	19(***)	53(***)	104(***)	199(8)
LA. GULF	212(***)	1512(***)	0(0)	387(***)	2111(10)
ARK., LA. INLAND., ETC.	90(***)	5(***)	27(***)	78(6)	200(9)
NEW MEXICO	31(***)	2(***)	0(0)	1(***)	34(5)
P.A.D. DISTRICT IV	34(***)	227(6)	136(5)	119(7)	516(18)
OTHER ROCKY MT.	34(***)	227(6)	136(5)	119(7)	516(18)
P.A.D. DISTRICT V	3325(8)	170(***)	6674(19)	1029(***)	11198(22)
WEST COAST	3325(8)	170(***)	6674(19)	1029(***)	11198(22)
TOTAL	5098(34)	5717(36)	10436(39)	6459(35)	27710(90)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-3. - STOCKS OF RESIDUAL FUEL OIL HELD AT REFINERIES BY SULFUR CONTENT
DECEMBER 1970
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	621(8)	2012(9)	740(7)	1371(12)	4744(21)
EAST COAST	594(***)	2012(9)	466(5)	1202(12)	4274(16)
APPALACHIAN NO. 1	27(***)	0(0)	274(***)	169(***)	470(7)
P.A.D. DISTRICT II	112(9)	1845(25)	3180(18)	1898(15)	7035(49)
APPALACHIAN NO. 2	0(0)	14(***)	0(0)	0(0)	14(***)
IND., ILL., ETC.	76(***)	1617(18)	2777(12)	634(8)	5104(29)
MINN., WISC., ETC.	16(***)	86(***)	187(***)	444(***)	733(6)
OKLA., KANS., ETC.	20(***)	128(7)	216(***)	820(6)	1184(18)
P.A.D. DISTRICT III	409(14)	1936(13)	722(11)	2113(24)	5180(48)
TEXAS GULF	353(5)	710(9)	630(6)	1596(10)	3289(21)
TEXAS INLAND	6(***)	8(***)	69(***)	118(***)	201(8)
LA. GULF	24(***)	1248(***)	10(***)	225(***)	1477(9)
ARK., LA. INLAND., ETC. ...	23(***)	0(0)	13(***)	173(7)	209(10)
NEW MEXICO	3(***)	0(0)	0(0)	1(***)	4(***)
P.A.D. DISTRICT IV	36(***)	164(7)	96(***)	245(12)	541(21)
OTHER ROCKY MT.	36(***)	164(7)	96(***)	245(12)	541(21)
P.A.D. DISTRICT V	0(0)	0(0)	0(0)	0(0)	0(0)
WEST COAST	0(0)	0(0)	0(0)	0(0)	0(0)
TOTAL	1178(31)	5957(37)	4738(26)	5627(43)	17500(85)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-3. - STOCKS OF RESIDUAL FUEL OIL HELD AT REFINERIES BY SULFUR CONTENT
JANUARY 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	232(9)	2215(10)	787(6)	1195(11)	4429(21)
EAST COAST	208(5)	2215(10)	300(***)	1195(11)	3918(16)
APPALACHIAN NO. 1	24(***)	0(0)	487(***)	0(0)	511(7)
P.A.D. DISTRICT II	279(9)	1564(23)	2449(18)	2171(14)	6463(47)
APPALACHIAN NO. 2	0(0)	23(***)	0(0)	0(0)	23(***)
IND., ILL., ETC.	223(***)	1377(15)	1980(11)	1190(8)	4770(27)
MINN., WISC., ETC.	14(***)	87(***)	242(***)	383(***)	726(6)
OKLA., KANS., ETC.	42(***)	77(6)	227(5)	598(5)	944(17)
P.A.D. DISTRICT III	665(12)	2311(14)	486(11)	2700(26)	6162(49)
TEXAS GULF	573(5)	1076(8)	413(6)	2098(11)	4160(21)
TEXAS INLAND	6(***)	9(***)	63(***)	155(***)	233(7)
LA. GULF	66(***)	1216(***)	1(***)	238(***)	1521(10)
ARK., LA. INLAND., ETC.....	15(***)	10(***)	9(***)	165(7)	199(10)
NEW MEXICO	5(***)	0(0)	0(0)	44(***)	49(***)
P.A.D. DISTRICT IV	38(***)	117(***)	93(***)	202(12)	450(18)
OTHER ROCKY MT.	38(***)	117(***)	93(***)	202(12)	450(18)
P.A.D. DISTRICT V	2285(8)	48(***)	7667(19)	4(***)	10004(24)
WEST COAST	2285(8)	48(***)	7667(19)	4(***)	10004(24)
TOTAL	3499(36)	6255(34)	11482(34)	6272(44)	27508(92)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-3. - STOCKS OF RESIDUAL FUEL OIL HELD AT REFINERIES BY SULFUR CONTENT
FEBRUARY 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	346(8)	2066(10)	1148(8)	817(9)	4377(21)
EAST COAST	322(***)	2066(10)	789(6)	730(9)	3907(16)
APPALACHIAN NO. 1	24(***)	0(0)	359(***)	87(***)	470(7)
P.A.D. DISTRICT II	58(8)	1348(25)	2370(21)	1352(12)	5128(45)
APPALACHIAN NO. 2	0(0)	17(***)	0(0)	0(0)	17(***)
IND., ILL., ETC.	33(***)	1149(18)	1873(13)	744(8)	3799(27)
MINN., WISC., ETC.	7(***)	79(***)	232(***)	307(***)	625(6)
OKLA., KANS., ETC.	18(***)	103(6)	265(6)	301(***)	687(16)
P.A.D. DISTRICT III	532(14)	2334(13)	603(10)	1806(18)	5275(41)
TEXAS GULF	408(5)	962(7)	535(***)	1280(9)	3185(19)
TEXAS INLAND	19(***)	9(***)	55(***)	103(***)	186(8)
LA. GULF	66(***)	1358(***)	1(***)	383(***)	1808(8)
ARK., LA. INLAND., ETC.	34(***)	5(***)	12(***)	40(5)	91(8)
NEW MEXICO	5(***)	0(0)	0(0)	0(0)	5(***)
P.A.D. DISTRICT IV	35(***)	144(6)	90(***)	147(8)	416(16)
OTHER ROCKY MT.	35(***)	144(6)	90(***)	147(8)	416(16)
P.A.D. DISTRICT V	2355(8)	70(***)	8216(19)	114(***)	10755(24)
WEST COAST	2355(8)	70(***)	8216(19)	114(***)	10755(24)
TOTAL	3326(35)	5962(38)	12427(39)	4236(33)	25951(85)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-3. - STOCKS OF RESIDUAL FUEL OIL HELD AT REFINERIES BY SULFUR CONTENT
MARCH 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	414(8)	2052(10)	900(8)	1041(10)	4407(21)
EAST COAST	393(***)	2052(10)	538(5)	1041(10)	4024(16)
APPALACHIAN NO. 1	21(***)	0(0)	362(***)	0(0)	383(7)
P.A.D. DISTRICT II	51(8)	1228(25)	1796(19)	1103(9)	4178(45)
APPALACHIAN NO. 2	0(0)	22(***)	0(0)	0(0)	22(***)
IND., ILL., ETC.	13(***)	1041(19)	1333(11)	598(5)	2985(27)
MINN., WISC., ETC.	5(***)	71(***)	244(***)	309(***)	629(6)
OKLA., KANS., ETC.	33(***)	94(5)	219(6)	196(***)	542(16)
P.A.D. DISTRICT III	431(15)	1833(13)	574(10)	1852(22)	4690(46)
TEXAS GULF	293(***)	782(7)	519(5)	1371(10)	2965(20)
TEXAS INLAND	11(***)	28(***)	49(***)	43(***)	131(9)
LA. GULF	94(***)	1018(***)	0(0)	398(***)	1510(9)
ARK., LA. INLAND., ETC......	22(***)	5(***)	6(***)	40(6)	73(9)
NEW MEXICO	11(***)	0(0)	0(0)	0(0)	11(***)
P.A.D. DISTRICT IV	38(***)	105(5)	214(5)	124(7)	481(17)
OTHER ROCKY MT.	38(***)	105(5)	214(5)	124(7)	481(17)
P.A.D. DISTRICT V	1870(7)	99(***)	7468(20)	780(***)	10217(24)
WEST COAST	1870(7)	99(***)	7468(20)	780(***)	10217(24)
TOTAL	2804(35)	5317(37)	10952(40)	4900(34)	23973(91)

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NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-4. - SHIPMENTS OF NO. 4 FUEL OIL FROM REFINERIES BY SULFUR CONTENT
DECEMBER 1970
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	34(***)	0(0)	24(***)	5(***)	63(***)
EAST COAST	34(***)	0(0)	24(***)	5(***)	63(***)
APPALACHIAN NO. 1	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT II	101(5)	20(***)	147(***)	46(***)	314(10)
APPALACHIAN NO. 2	0(0)	0(0)	0(0)	0(0)	0(0)
IND., ILL., ETC.	54(***)	20(***)	147(***)	0(0)	221(7)
MINN., WISC., ETC.	44(***)	0(0)	0(0)	46(***)	90(***)
OKLA., KANS., ETC.	3(***)	0(0)	0(0)	0(0)	3(***)
P.A.D. DISTRICT III	19(***)	0(0)	0(0)	0(0)	19(***)
TEXAS GULF	0(0)	0(0)	0(0)	0(0)	0(0)
TEXAS INLAND	12(***)	0(0)	0(0)	0(0)	12(***)
LA. GULF	0(0)	0(0)	0(0)	0(0)	0(0)
ARK., LA. INLAND., ETC.	7(***)	0(0)	0(0)	0(0)	7(***)
NEW MEXICO	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT IV	0(0)	30(***)	0(0)	0(0)	30(***)
OTHER ROCKY MT.	0(0)	30(***)	0(0)	0(0)	30(***)
P.A.D. DISTRICT V	0(0)	0(0)	0(0)	0(0)	0(0)
WEST COAST	0(0)	0(0)	0(0)	0(0)	0(0)
TOTAL	154(7)	50(***)	171(***)	51(***)	426(14)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-4. - SHIPMENTS OF NO. 4 FUEL OIL FROM REFINERIES BY SULFUR CONTENT
JANUARY 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	55(***)	0(0)	0(0)	26(***)	81(***)
EAST COAST	55(***)	0(0)	0(0)	26(***)	81(***)
APPALACHIAN NO. 1	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT II	198(5)	24(***)	138(***)	89(***)	449(11)
APPALACHIAN NO. 2	0(0)	0(0)	0(0)	0(0)	0(0)
IND., ILL., ETC.	112(***)	24(***)	138(***)	37(***)	311(8)
MINN., WISC., ETC.	83(***)	0(0)	0(0)	52(***)	135(***)
OKLA., KANS., ETC.	3(***)	0(0)	0(0)	0(0)	3(***)
P.A.D. DISTRICT III	20(***)	0(0)	0(0)	1(***)	21(***)
TEXAS GULF	3(***)	0(0)	0(0)	0(0)	3(***)
TEXAS INLAND	6(***)	0(0)	0(0)	0(0)	6(***)
LA. GULF	0(0)	0(0)	0(0)	0(0)	0(0)
ARK., LA. INLAND., ETC......	12(***)	0(0)	0(0)	1(***)	12(***)
NEW MEXICO	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT IV	12(***)	0(0)	5(***)	1(***)	18(***)
OTHER ROCKY MT.	12(***)	0(0)	5(***)	1(***)	18(***)
P.A.D. DISTRICT V	672(***)	0(0)	0(0)	0(0)	672(***)
WEST COAST	672(***)	0(0)	0(0)	0(0)	672(***)
TOTAL	957(12)	24(***)	143(***)	117(5)	1241(20)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-4. - SHIPMENTS OF NO. 4 FUEL OIL FROM REFINERIES BY SULFUR CONTENT
FEBRUARY 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	195(***)	0(0)	0(0)	18(***)	213(***)
EAST COAST	195(***)	0(0)	0(0)	18(***)	213(***)
APPALACHIAN NO. 1	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT II	214(7)	65(***)	131(***)	63(***)	473(12)
APPALACHIAN NO. 2	0(0)	0(0)	0(0)	0(0)	0(0)
IND., ILL., ETC.	158(5)	65(***)	131(***)	31(***)	385(9)
MINN., WISC., ETC.	54(***)	0(0)	0(0)	32(***)	86(***)
OKLA., KANS., ETC.	2(***)	0(0)	0(0)	0(0)	2(***)
P.A.D. DISTRICT III	31(***)	0(0)	0(0)	30(***)	61(***)
TEXAS GULF	24(***)	0(0)	0(0)	0(0)	24(***)
TEXAS INLAND	3(***)	0(0)	0(0)	0(0)	3(***)
LA. GULF	0(0)	0(0)	0(0)	0(0)	0(0)
ARK., LA. INLAND., ETC.	4(***)	0(0)	0(0)	30(***)	34(***)
NEW MEXICO	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT IV	11(***)	12(***)	12(***)	1(***)	36(***)
OTHER ROCKY MT.	11(***)	12(***)	12(***)	1(***)	36(***)
P.A.D. DISTRICT V	672(***)	0(0)	0(0)	0(0)	672(***)
WEST COAST	672(***)	0(0)	0(0)	0(0)	672(***)
TOTAL	1123(14)	77(***)	143(***)	112(5)	1455(23)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-4. - SHIPMENTS OF NO. 4 FUEL OIL FROM REFINERIES BY SULFUR CONTENT
MARCH 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	41(***)	0(0)	1(***)	11(***)	53(***)
EAST COAST	41(***)	0(0)	1(***)	11(***)	53(***)
APPALACHIAN NO. 1	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT II	133(5)	31(5)	69(***)	87(***)	320(14)
APPALACHIAN NO. 2	0(0)	0(0)	0(0)	0(0)	0(0)
IND., ILL., ETC.	130(***)	21(***)	69(***)	24(***)	244(11)
MINN., WISC., ETC.	0(0)	0(0)	0(0)	63(***)	63(***)
OKLA., KANS., ETC.	3(***)	10(***)	0(0)	0(0)	13(***)
P.A.D. DISTRICT III	22(***)	0(0)	0(0)	0(0)	22(***)
TEXAS GULF	0(0)	0(0)	0(0)	0(0)	0(0)
TEXAS INLAND	7(***)	0(0)	0(0)	0(0)	7(***)
LA. GULF	5(***)	0(0)	0(0)	0(0)	5(***)
ARK., LA. INLAND., ETC.....	10(***)	0(0)	0(0)	0(0)	10(***)
NEW MEXICO	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT IV	8(***)	0(0)	9(***)	1(***)	18(***)
OTHER ROCKY MT.	8(***)	0(0)	9(***)	1(***)	18(***)
P.A.D. DISTRICT V	672(***)	0(0)	0(0)	53(***)	725(***)
WEST COAST	672(***)	0(0)	0(0)	53(***)	725(***)
TOTAL	876(11)	31(5)	79(***)	152(5)	1138(23)

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NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-5. - STOCKS OF NO. 4 FUEL OIL HELD AT REFINERIES BY SULFUR CONTENT
DECEMBER 1970
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0	TOTAL
P.A.D. DISTRICT I	11(***)	0(0)	9(***)	4(***)	24(***)
EAST COAST	11(***)	0(0)	9(***)	4(***)	24(***)
APPALACHIAN NO. 1	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT II	134(***)	3(***)	4(***)	5(***)	146(6)
APPALACHIAN NO. 2	0(0)	0(0)	0(0)	0(0)	0(0)
IND., ILL., ETC.	4(***)	3(***)	4(***)	5(***)	16(***)
MINN., WISC., ETC.	128(***)	0(0)	0(0)	0(0)	128(***)
OKLA., KANS., ETC.	2(***)	0(0)	0(0)	0(0)	2(***)
P.A.D. DISTRICT III	103(***)	213(***)	0(0)	0(0)	316(***)
TEXAS GULF	77(***)	192(***)	0(0)	0(0)	269(***)
TEXAS INLAND	4(***)	0(0)	0(0)	0(0)	4(***)
LA. GULF	0(0)	21(***)	0(0)	0(0)	21(***)
ARK., LA. INLAND., ETC.....	22(***)	0(0)	0(0)	0(0)	22(***)
NEW MEXICO	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT IV	0(0)	3(***)	0(0)	0(0)	3(***)
OTHER ROCKY MT.	0(0)	3(***)	0(0)	0(0)	3(***)
P.A.D. DISTRICT V	0(0)	0(0)	0(0)	0(0)	0(0)
WEST COAST	0(0)	0(0)	0(0)	0(0)	0(0)
TOTAL	248(7)	219(***)	13(***)	9(***)	489(11)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-5. - STOCKS OF NO. 4 FUEL OIL WELD AT REFINERIES BY SULFUR CONTENT
JANUARY 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
P.A.D. DISTRICT I	183(***)	379(***)	72(***)	290(***)	924(5)
EAST COAST	183(***)	379(***)	72(***)	290(***)	924(5)
APPALACHIAN NO. 1	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT II	32(***)	2(***)	7(***)	5(***)	46(6)
APPALACHIAN NO. 2	0(0)	0(0)	0(0)	0(0)	0(0)
IND., ILL., ETC.	4(***)	2(***)	7(***)	5(***)	18(***)
MINN., WISC., ETC.	27(***)	0(0)	0(0)	0(0)	27(***)
OKLA., KANS., ETC.	1(***)	0(0)	0(0)	0(0)	1(***)
P.A.D. DISTRICT III	30(***)	123(***)	0(0)	0(0)	153(***)
TEXAS GULF	0(0)	97(***)	0(0)	0(0)	97(***)
TEXAS INLAND	3(***)	0(0)	0(0)	0(0)	3(***)
LA. GULF	0(0)	26(***)	0(0)	0(0)	26(***)
ARK., LA. INLAND., ETC.....	27(***)	0(0)	0(0)	0(0)	27(***)
NEW MEXICO	0(0)	0(0)	0(0)	0(0)	0(0)
P.A.D. DISTRICT IV	2(***)	0(0)	3(***)	0(0)	5(***)
OTHER ROCKY MT.	2(***)	0(0)	3(***)	0(0)	5(***)
P.A.D. DISTRICT V	466(***)	0(0)	0(0)	0(0)	466(***)
WEST COAST	466(***)	0(0)	0(0)	0(0)	466(***)
TOTAL	713(8)	504(***)	82(***)	295(***)	1594(13)

NOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-5. - STOCKS OF NO. 4 FUEL OIL HELD AT REFINERIES BY SULFUR CONTENT
FEBRUARY 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
.A.D. DISTRICT I	205(***)	202(***)	88(***)	7(***)	502(5)
EAST COAST	205(***)	202(***)	88(***)	7(***)	502(5)
APPALACHIAN NO. 1	0(0)	0(0)	0(0)	0(0)	0(0)
.A.D. DISTRICT II	36(***)	4(***)	6(***)	5(***)	51(7)
APPALACHIAN NO. 2	0(0)	0(0)	0(0)	0(0)	0(0)
IND., ILL., ETC.	8(***)	4(***)	6(***)	5(***)	23(5)
MINN., WISC., ETC.	26(***)	0(0)	0(0)	0(0)	26(***)
OKLA., KANS., ETC.	2(***)	0(0)	0(0)	0(0)	2(***)
.A.D. DISTRICT III	72(***)	51(***)	0(0)	0(0)	123(***)
TEXAS GULF	36(***)	38(***)	0(0)	0(0)	74(***)
TEXAS INLAND	6(***)	0(0)	0(0)	0(0)	6(***)
LA. GULF	0(0)	13(***)	0(0)	0(0)	13(***)
ARK., LA. INLAND., ETC.	30(***)	0(0)	0(0)	0(0)	30(***)
NEW MEXICO	0(0)	0(0)	0(0)	0(0)	0(0)
.A.D. DISTRICT IV	2(***)	0(0)	1(***)	0(0)	3(***)
OTHER ROCKY MT.	2(***)	0(0)	1(***)	0(0)	3(***)
.A.D. DISTRICT V	466(***)	0(0)	0(0)	0(0)	466(***)
WEST COAST	466(***)	0(0)	0(0)	0(0)	466(***)
OTAL	781(11)	257(***)	95(***)	12(***)	1145(15)

IOTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-5. - STOCKS OF NO. 4 FUEL OIL HELD AT REFINERIES BY SULFUR CONTENT
MARCH 1971
(THOUSANDS OF BARRELS)

DISTRICTS	UNDER 0.5	0.6-1.0	1.1-2.0	OVER 2.0,	TOTAL
.A.D. DISTRICT I	384(***)	266(***)	16(***)	6(***)	672(5)
EAST COAST	384(***)	266(***)	16(***)	6(***)	672(5)
APPALACHIAN NO. 1	0(0)	0(0)	0(0)	0(0)	0(0)
.A.D. DISTRICT II	146(5)	46(***)	12(***)	5(***)	209(11)
APPALACHIAN NO. 2	0(0)	0(0)	0(0)	0(0)	0(0)
IND., ILL., ETC.	69(***)	5(***)	12(***)	5(***)	91(8)
MINN., WISC., ETC.	75(***)	0(0)	0(0)	0(0)	75(***)
OKLA., KANS., ETC.	2(***)	41(***)	0(0)	0(0)	43(***)
.A.D. DISTRICT III	90(5)	91(***)	20(***)	0(0)	201(6)
TEXAS GULF	54(***)	71(***)	0(0)	0(0)	125(***)
TEXAS INLAND	5(***)	0(0)	0(0)	0(0)	5(***)
LA. GULF	1(***)	20(***)	20(***)	0(0)	41(***)
ARK., LA. INLAND., ETC.	30(***)	0(0)	0(0)	0(0)	30(***)
NEW MEXICO	0(0)	0(0)	0(0)	0(0)	0(0)
.A.D. DISTRICT IV	0(0)	0(0)	2(***)	0(0)	2(***)
OTHER ROCKY MT.	0(0)	0(0)	2(***)	0(0)	2(***)
.A.D. DISTRICT V	466(***)	0(0)	0(0)	18(***)	484(***)
WEST COAST	466(***)	0(0)	0(0)	18(***)	484(***)
OTAL	1086(13)	403(5)	50(***)	29(***)	1568(22)

OTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(*** IF LESS THAN 5 COMPANIES)

TABLE C-6. - BULK TERMINAL STOCKS OF NO. 4 FUEL OIL BY SULFUR CONTENT

DECEMBER 1970
(THOUSANDS OF BARRELS)

DISTRICT	UNDER 0.6	0.6-1.0	1.1-2.0	OVER 2.0	TOTAL
AST COAST TOTAL.............	518(8)	882(7)	1347(5)	100(**)	2847(13)
NEW ENGLAND.............	0(0)	136(**)	455(5)	11(**)	602(8)
MIDDLE ATLANTIC.........	518(8)	746(5)	824(**)	88(**)	2176(12)
SOUTH ATLANTIC..........	0(0)	0(0)	68(**)	1(**)	69(**)
PPALACHIAN DISTRICT 1.......	0(0)	0(0)	0(0)	0(0)	0(0)
PPALACHIAN DISTRICT 2.......	0(0)	0(0)	0(0)	1(**)	1(**)
NDIANA, ILL., KY., ETC......	0(0)	0(0)	0(0)	0(0)	0(0)
INN., WIS., N. DAK., S. DAK.	0(0)	0(0)	0(0)	0(0)	0(0)
KLA., KANS., MO., ETC.......	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS INLAND.................	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS GULF...................	0(0)	0(0)	0(0)	0(0)	0(0)
OUISIANA GULF...............	0(0)	0(0)	0(0)	0(0)	0(0)
RK., INLAND LA., ETC........	0(0)	0(0)	0(0)	0(0)	0(0)
EW MEXICO...................	0(0)	0(0)	0(0)	0(0)	0(0)
OCKY MOUNTAIN...............	0(0)	0(0)	0(0)	0(0)	0(0)
EST COAST...................	0(0)	0(0)	0(0)	0(0)	0(0)
OTAL........................	518(8)	882(7)	1347(5)	101(**)	2848(13)

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OTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(** IF LESS THAN 5 COMPANIES)

TABLE C-6. - BULK TERMINAL STOCKS OF NO. 4 FUEL OIL BY SULFUR CONTENT
JANUARY 1971
(THOUSANDS OF BARRELS)

DISTRICT	UNDER 0.6	0.6-1.0	1.1-2.0	OVER 2.0	TOTAL
AST COAST TOTAL	737(7)	482(6)	684(5)	5(**)	1908(12)
NEW ENGLAND	0(0)	15(**)	296(5)	0(0)	311(6)
MIDDLE ATLANTIC	737(7)	467(5)	337(**)	4(**)	1545(11)
SOUTH ATLANTIC	0(0)	0(0)	51(**)	1(**)	52(**)
PPALACHIAN DISTRICT 1	0(0)	0(0)	0(0)	0(0)	0(0)
PPALACHIAN DISTRICT 2	0(0)	0(0)	0(0)	1(**)	1(**)
NDIANA, ILL., KY., ETC.	0(0)	3(**)	2(**)	16(**)	21(**)
INN., WIS., N. DAK., S. DAK.	0(0)	0(0)	0(0)	0(0)	0(0)
KLA., KANS., MO., ETC.	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS INLAND	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS GULF	0(0)	0(0)	0(0)	0(0)	0(0)
OUISIANA GULF	0(0)	0(0)	0(0)	0(0)	0(0)
RK., INLAND LA., ETC.	0(0)	0(0)	0(0)	0(0)	0(0)
EW MEXICO	0(0)	0(0)	0(0)	0(0)	0(0)
OCKY MOUNTAIN	0(0)	0(0)	0(0)	0(0)	0(0)
EST COAST	0(0)	0(0)	0(0)	0(0)	0(0)
OTAL	737(7)	485(7)	686(6)	22(**)	1930(13)

OTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(** IF LESS THAN 5 COMPANIES)

TABLE C-6. - BULK TERMINAL STOCKS OF NO. 4 FUEL OIL BY SULFUR CONTENT
FEBRUARY 1971
(THOUSANDS OF BARRELS)

DISTRICT	UNDER 0.6	0.6-1.0	1.1-2.0	OVER 2.0	TOTAL
AST COAST TOTAL..............	687(8)	795(8)	750(6)	85(**)	2317(13)
NEW ENGLAND.............	0(0)	112(**)	376(5)	7(**)	495(7)
MIDDLE ATLANTIC..........	687(8)	683(7)	341(**)	77(**)	1788(12)
SOUTH ATLANTIC..........	0(0)	0(0)	33(**)	1(**)	34(**)
PPALACHIAN DISTRICT 1.......	0(0)	0(0)	0(0)	0(0)	0(0)
PPALACHIAN DISTRICT 2.......	0(0)	0(0)	0(0)	1(**)	1(**)
NDIANA, ILL., KY., ETC......	0(0)	2(**)	2(**)	0(0)	4(**)
INN., WIS., N. DAK., S. DAK.	0(0)	0(0)	0(0)	0(0)	0(0)
KLA., KANS., MO., ETC........	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS INLAND................	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS GULF..................	0(0)	0(0)	0(0)	0(0)	0(0)
OUISIANA GULF..............	0(0)	0(0)	0(0)	0(0)	0(0)
RK., INLAND LA., ETC........	0(0)	0(0)	0(0)	0(0)	0(0)
EW MEXICO..................	0(0)	0(0)	0(0)	0(0)	0(0)
OCKY MOUNTAIN..............	0(0)	0(0)	0(0)	0(0)	0(0)
EST COAST..................	0(0)	0(0)	0(0)	139(**)	139(**)
OTAL.......................	687(8)	797(9)	752(7)	225(**)	2461(15)

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OTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(** IF LESS THAN 5 COMPANIES)

TABLE C-6. - BULK TERMINAL STOCKS OF NO. 4 FUEL OIL BY SULFUR CONTENT
MARCH 1971
(THOUSANDS OF BARRELS)

DISTRICT	UNDER 0.6	0.6-1.0	1.1-2.0	OVER 2.0	TOTAL
AST COAST TOTAL..............	442(6)	794(8)	756(6)	339(**)	2331(14)
NEW ENGLAND..............	0(0)	109(**)	392(5)	87(**)	588(9)
MIDDLE ATLANTIC..........	442(6)	685(6)	341(**)	251(**)	1719(12)
SOUTH ATLANTIC...........	0(0)	0(0)	23(**)	1(**)	24(**)
PPALACHIAN DISTRICT 1.......	0(0)	0(0)	0(0)	0(0)	0(0)
PPALACHIAN DISTRICT 2.......	0(0)	0(0)	0(0)	1(**)	1(**)
NDIANA, ILL., KY., ETC.......	0(0)	2(**)	1(**)	0(0)	3(**)
INN., WIS., N. DAK., S. DAK.	0(0)	0(0)	0(0)	0(0)	0(0)
KLA., KANS., MO., ETC.......	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS INLAND................	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS GULF..................	0(0)	0(0)	0(0)	0(0)	0(0)
OUISIANA GULF..............	0(0)	0(0)	0(0)	0(0)	0(0)
RK., INLAND LA., ETC.........	0(0)	0(0)	0(0)	0(0)	0(0)
EW MEXICO..................	0(0)	0(0)	0(0)	0(0)	0(0)
OCKY MOUNTAIN..............	0(0)	0(0)	0(0)	0(0)	0(0)
EST COAST..................	0(0)	0(0)	0(0)	0(0)	0(0)
OTAL.......................	442(6)	796(9)	757(7)	340(**)	2335(15)

OTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(** IF LESS THAN 5 COMPANIES)

TABLE C-7. - BULK TERMINAL STOCKS OF RESIDUAL FUEL OIL BY SULFUR CONTENT
DECEMBER 1970
(THOUSANDS OF BARRELS)

DISTRICT	UNDER 0.6	0.6-1.0	1.1-2.0	OVER 2.0	TOTAL
AST COAST TOTAL..............	1704(6)	7270(8)	2572(8)	7846(8)	19392(15)
NEW ENGLAND.............	0(0)	576(5)	284(**)	2787(7)	3647(10)
MIDDLE ATLANTIC.........	1702(5)	6665(7)	1654(**)	2394(5)	12415(12)
SOUTH ATLANTIC..........	2(**)	29(**)	634(5)	2665(7)	3330(9)
PPALACHIAN DISTRICT 1.......	0(0)	0(0)	0(0)	0(0)	0(0)
PPALACHIAN DISTRICT 2.......	0(0)	30(**)	0(0)	0(0)	30(**)
NDIANA, ILL., KY., ETC......	237(**)	334(**)	289(**)	569(**)	1429(6)
INN., WIS., N. DAK., S. DAK.	0(0)	155(**)	5(**)	87(**)	247(**)
KLA., KANS., MO., ETC.......	0(0)	0(0)	0(0)	84(**)	84(**)
EXAS INLAND.................	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS GULF...................	25(**)	351(**)	0(0)	341(**)	717(**)
OUISIANA GULF...............	22(**)	0(0)	0(0)	113(**)	135(**)
RK., INLAND LA., ETC........	0(0)	0(0)	0(0)	0(0)	0(0)
EW MEXICO...................	0(0)	0(0)	0(0)	0(0)	0(0)
OCKY MOUNTAIN...............	0(0)	0(0)	0(0)	0(0)	0(0)
EST COAST...................	0(0)	0(0)	0(0)	0(0)	0(0)
OTAL........................	1988(8)	8140(11)	2866(10)	9040(10)	22034(18)

OTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(** IF LESS THAN 5 COMPANIES)

TABLE C-7. - BULK TERMINAL STOCKS OF RESIDUAL FUEL OIL BY SULFUR CONTENT
JANUARY 1971
(THOUSANDS OF BARRELS)

DISTRICT	UNDER 0.6	0.6-1.0	1.1-2.0	OVER 2.0	TOTAL
AST COAST TOTAL	953(5)	4659(8)	2203(7)	6153(8)	13968(14)
NEW ENGLAND	0(0)	530(**)	254(**)	1231(6)	2015(9)
MIDDLE ATLANTIC	892(**)	4129(7)	1273(**)	2331(5)	8625(11)
SOUTH ATLANTIC	61(**)	0(0)	676(5)	2591(6)	3328(8)
PPALACHIAN DISTRICT 1	0(0)	122(**)	0(0)	0(0)	122(**)
PPALACHIAN DISTRICT 2	0(0)	338(**)	0(0)	0(0)	338(**)
NDIANA, ILL., KY., ETC.	275(**)	656(**)	538(**)	483(**)	1952(7)
INN., WIS., N. DAK., S. DAK.	0(0)	213(**)	5(**)	91(**)	309(**)
KLA., KANS., MO., ETC.	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS INLAND	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS GULF	25(**)	420(**)	0(0)	348(**)	793(**)
OUISIANA GULF	66(**)	41(**)	0(0)	38(**)	145(**)
RK., INLAND LA., ETC.	0(0)	0(0)	0(0)	0(0)	0(0)
EW MEXICO	0(0)	0(0)	0(0)	0(0)	0(0)
OCKY MOUNTAIN	0(0)	0(0)	0(0)	0(0)	0(0)
EST COAST	1729(**)	40(**)	2958(**)	0(0)	4727(**)
OTAL	3048(9)	6489(13)	5704(12)	7113(10)	22354(19)

OTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(** IF LESS THAN 5 COMPANIES)

TABLE C-7. - BULK TERMINAL STOCKS OF RESIDUAL FUEL OIL BY SULFUR CONTENT
FEBRUARY 1971
(THOUSANDS OF BARRELS)

DISTRICT	UNDER 0.6	0.6-1.0	1.1-2.0	OVER 2.0	TOTAL
AST COAST TOTAL..............	878(6)	4465(10)	2508(9)	6781(8)	14632(14)
NEW ENGLAND.............	0(0)	638(**)	546(5)	1838(7)	3022(9)
MIDDLE ATLANTIC..........	825(5)	3827(10)	1450(**)	2442(5)	8544(13)
SOUTH ATLANTIC...........	53(**)	0(0)	512(5)	2501(7)	3066(8)
PPALACHIAN DISTRICT 1........	0(0)	88(**)	0(0)	0(0)	88(**)
PPALACHIAN DISTRICT 2........	0(0)	339(**)	1(**)	0(0)	340(**)
NDIANA, ILL., KY., ETC.......	146(**)	457(**)	390(5)	469(**)	1462(7)
INN., WIS., N. DAK., S. DAK.	0(0)	206(**)	5(**)	110(**)	321(**)
KLA., KANS., MO., ETC........	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS INLAND.................	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS GULF...................	12(**)	300(**)	0(0)	229(**)	541(**)
OUISIANA GULF...............	135(**)	56(**)	0(0)	117(**)	308(**)
RK., INLAND LA., ETC.........	0(0)	0(0)	0(0)	0(0)	0(0)
EW MEXICO...................	0(0)	0(0)	0(0)	0(0)	0(0)
OCKY MOUNTAIN...............	0(0)	0(0)	0(0)	0(0)	0(0)
EST COAST...................	1670(**)	35(**)	2858(**)	1804(**)	6367(**)
OTAL........................	2841(11)	5946(15)	5762(14)	9510(11)	24059(20)

OTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(** IF LESS THAN 5 COMPANIES)

TABLE C-7. - BULK TERMINAL STOCKS OF RESIDUAL FUEL OIL BY SULFUR CONTENT
MARCH 1971
(THOUSANDS OF BARRELS)

DISTRICT	UNDER 0.6	0.6-1.0	1.1-2.0	OVER 2.0	TOTAL
AST COAST TOTAL	1876(6)	4706(10)	1738(7)	9697(8)	18017(13)
NEW ENGLAND	0(0)	1011(**)	464(**)	2528(6)	4003(8)
MIDDLE ATLANTIC	1823(5)	3695(10)	734(**)	4139(6)	10391(12)
SOUTH ATLANTIC	53(**)	0(0)	540(5)	3030(7)	3623(8)
PPALACHIAN DISTRICT 1	0(0)	79(**)	0(0)	0(0)	79(**)
PPALACHIAN DISTRICT 2	0(0)	331(**)	2(**)	0(0)	333(**)
NDIANA, ILL., KY., ETC.	204(**)	612(**)	311(**)	404(**)	1531(6)
INN., WIS., N. DAK., S. DAK.	0(0)	219(**)	5(**)	104(**)	328(**)
KLA., KANS., MO., ETC.	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS INLAND	0(0)	0(0)	0(0)	0(0)	0(0)
EXAS GULF	25(**)	91(**)	0(0)	271(**)	387(**)
OUISIANA GULF	110(**)	65(**)	0(0)	31(**)	206(**)
RK., INLAND LA., ETC.	0(0)	0(0)	0(0)	0(0)	0(0)
EW MEXICO	0(0)	0(0)	0(0)	0(0)	0(0)
OCKY MOUNTAIN	0(0)	0(0)	0(0)	0(0)	0(0)
EST COAST	162(**)	0(0)	2013(**)	1698(**)	3873(**)
OTAL	2377(11)	6103(14)	4069(13)	12205(11)	24754(19)

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OTE PARENTHESES CONTAIN NUMBER OF CONTRIBUTING COMPANIES
(** IF LESS THAN 5 COMPANIES)

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969

STATE..ALABAMA	DISTRICT$.00		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
BALDWIN	0 (0)	0 (0)	0 (0)	0 (0)	25475 (1)
CHOCTAW	0 (0)	0 (0)	0 (0)	426738 (3)	460006 (4)
CLARKE	0 (0)	0 (0)	0 (0)	0 (0)	141882 (1)
ESCAMBIA	0 (0)	224363 (1)	0 (0)	0 (0)	0 (0)
MOBILE	6406947 (1)	0 (0)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	6406947 (1)	224363 (1)	0 (0)	426738 (3)	627363 (6)
STATE TOTAL	6406947 (1)	224363 (1)	0 (0)	426738 (3)	627363 (6)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,ALASKA

DISTRICT,,00

		-SULFUR LEVELS-			
COUNTY	0-,50	,51-1,00	1,01-2,00	OVER 2,00	NO SULFUR
ALEUTIAN ISLANDS	0 (0)	277377 (1)	0 (0)	0 (0)	0 (0)
KENAI PENINSULA	50418087 (3)	0 (0)	0 (0)	0 (0)	0 (0)
KENAI PENINSULA BORO-SE	13150877 (1)	0 (0)	0 (0)	0 (0)	0 (0)
UNDEFINED	10467090 (1)	0 (0)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	74036054 (5)	277377 (1)	0 (0)	0 (0)	0 (0)
STATE TOTAL	74036054 (5)	277377 (1)	0 (0)	0 (0)	0 (0)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,.1969 (CONTINUED)

STATE,.ARIZONA DISTRICT[illegible].00

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
APACHE	2309596 (2)	0 (0)	0 (0)	0 (0)	108132 (2)
DISTRICT TOTAL	2309596 (2)	0 (0)	0 (0)	0 (0)	108132 (2)
STATE TOTAL	2309596 (2)	0 (0)	0 (0)	0 (0)	108132 (2)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..ARKANSAS

DISTRICT..02

	-SULFUR LEVELS-				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
BRADLEY	0 (0)	0 (0)	0 (0)	0 (0)	73011 (4)
CALHOUN	0 (0)	0 (0)	0 (0)	68511 (3)	51111 (4)
COLUMBIA	726579 (7)	1596375 (7)	257062 (2)	0 (0)	228949 (18)
HEMPSTEAD	0 (0)	0 (0)	0 (0)	0 (0)	5074 (1)
LAFAYETTE	294987 (1)	21021 (2)	1577002 (2)	33694 (2)	640876 (33)
MILLER	89687 (2)	0 (0)	328330 (2)	0 (0)	843566 (24)
NEVADA	0 (0)	0 (0)	16534 (1)	224739 (9)	481498 (12)
OUACHITA	0 (0)	0 (0)	1750391 (9)	28733 (4)	741809 (34)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-6 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..ARKANSAS DISTRICT..02

			-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
UNION	20371 (2)	231337 (7)	1392164 (12)	3956677 (9)	1479132 (78)
DISTRICT TOTAL	1131624 (12)	1848733 (16)	5321483 (28)	4312354 (27)	4545026 (208)
STATE TOTAL	1131624 (12)	1848733 (16)	5321483 (28)	4312354 (27)	4545026 (208)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..CALIFORNIA DISTRICT..01

	-SULFUR LEVELS-				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
ALAMEDA	161829 (1)	0 (0)	0 (0)	0 (0)	0 (0)
CONTRA COSTA	651581 (9)	0 (0)	0 (0)	0 (0)	0 (0)
FRESNO	13202287 (24)	4466395 (6)	0 (0)	0 (0)	0 (0)
KERN	38657734 (181)	53200338 (45)	28490625 (7)	0 (0)	17584 (2)
KINGS	177773 (6)	0 (0)	0 (0)	0 (0)	0 (0)
SAN BENITO	57380 (5)	0 (0)	0 (0)	0 (0)	0 (0)
SAN LUIS OBISPO	91502 (6)	0 (0)	0 (0)	0 (0)	0 (0)
SANTA BARBARA	3698143 (7)	0 (0)	0 (0)	0 (0)	0 (0)
TULARE	34620 (1)	0 (0)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	56732849 (240)	57666733 (51)	28490625 (7)	0 (0)	17584 (2)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,CALIFORNIA DISTRICT,,02

	-SULFUR LEVELS-				
COUNTY	0-,50	,51-1,00	1,01-2,00	OVER 2,00	NO SULFUR
CONTRA COSTA	0 (0)	0 (0)	0 (0)	0 (0)	5575 (1)
LOS ANGELES	1909768 (34)	1615240 (10)	545964 (3)	505618 (1)	0 (0)
MONTEREY	115047 (5)	0 (0)	0 (0)	10409107 (2)	0 (0)
SAN BENITO	8100 (1)	0 (0)	0 (0)	0 (0)	0 (0)
SAN LUIS OBISPO	990 (1)	0 (0)	121400 (1)	1583909 (1)	0 (0)
SAN MATEO	25638 (3)	0 (0)	0 (0)	0 (0)	0 (0)
SANTA BARBARA	11937038 (17)	1128074 (2)	0 (0)	11582894 (14)	3322389 (2)
VENTURA	12272777 (59)	3828432 (10)	2813853 (9)	2781223 (5)	10063 (2)
DISTRICT TOTAL	26269358 (120)	6571746 (22)	3481217 (13)	26862751 (23)	3338027 (5)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,CALIFORNIA DISTRICT,,03

			-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
LOS ANGELES	99476891 (143)	5417777 (20)	15751353 (24)	7052190 (9)	1759 (2)
ORANGE	2999063 (18)	6934462 (8)	24516747 (21)	2376802 (6)	0 (0)
RIVERSIDE	0 (0)	0 (0)	0 (0)	0 (0)	50645 (1)
SAN BERNARDINO	166539 (4)	0 (0)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	102642493 (165)	12352239 (28)	40268100 (45)	9428992 (15)	52404 (3)
STATE TOTAL	185644700 (525)	76590718 (101)	72239942 (65)	36291743 (38)	3408015 (10)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..COLORADO

DISTRICT..01

	-SULFUR LEVELS-				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
ADAMS	138236 (3)	0 (0)	0 (0)	0 (0)	335280 (18)
ARAPAHOE	0 (0)	0 (0)	0 (0)	0 (0)	281936 (3)
BACA	0 (0)	0 (0)	0 (0)	0 (0)	74281 (3)
BOULDER	875 (1)	0 (0)	0 (0)	0 (0)	0 (0)
CHEYENNE	0 (0)	0 (0)	0 (0)	0 (0)	416747 (6)
ELBERT	0 (0)	0 (0)	0 (0)	0 (0)	6739 (1)
FREMONT	33024 (1)	0 (0)	0 (0)	0 (0)	0 (0)
JACKSON	178691 (3)	0 (0)	0 (0)	0 (0)	0 (0)
KIOWA	983796 (1)	0 (0)	0 (0)	0 (0)	114147 (3)
LARIMER	192006 (4)	0 (0)	0 (0)	0 (0)	71896 (1)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..COLORADO

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
	DISTRICT..01				
LOGAN	909224 (24)	0 (0)	0 (0)	141092 (1)	1296931 (44)
MORGAN	421145 (9)	0 (0)	0 (0)	0 (0)	447572 (25)
PROWERS	0 (0)	0 (0)	0 (0)	0 (0)	1280 (1)
WASHINGTON	976517 (12)	0 (0)	0 (0)	0 (0)	3382111 (67)
WELD	30464 (4)	291921 (1)	0 (0)	0 (0)	806029 (30)
DISTRICT TOTAL	3863978 (62)	291921 (1)	0 (0)	141092 (1)	7234949 (202)
	DISTRICT..02				
MOFFAT	1321993 (9)	103569 (1)	2854 (1)	0 (0)	32554 (2)
RIO BLANCO	2319177 (2)	12099051 (1)	0 (0)	0 (0)	0 (0)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..COLORADO	DISTRICT..02		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
ROUTT	17344 (1)	0 (0)	0 (0)	0 (0)	68107 (4)
DISTRICT TOTAL	3658514 (12)	12202620 (2)	2854 (1)	0 (0)	100661 (6)
	DISTRICT..03				
ARCHULETA	51156 (2)	0 (0)	0 (0)	0 (0)	0 (0)
LA PLATA	14776 (1)	0 (0)	0 (0)	0 (0)	7520 (1)
MONTEZUMA	315317 (5)	0 (0)	0 (0)	0 (0)	753 (1)
DISTRICT TOTAL	381249 (8)	0 (0)	0 (0)	0 (0)	8273 (2)
STATE TOTAL	7903741 (82)	12494541 (3)	2854 (1)	141092 (1)	7343883 (210)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..FLORIDA DISTRICT[illegible].00

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
COLLIER	0 (0)	0 (0)	0 (0)	571000 (1)	60000 (1)
HENDRY	0 (0)	0 (0)	0 (0)	0 (0)	1102485 (1)
DISTRICT TOTAL	0 (0)	0 (0)	0 (0)	571000 (1)	1162485 (2)
STATE TOTAL	0 (0)	0 (0)	0 (0)	571000 (1)	1162485 (2)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE,.ILLINOIS	DISTRICT..00		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1,00	1.01-2,00	OVER 2.00	NO SULFUR
ADAMS	0 (0)	0 (0)	0 (0)	0 (0)	4100 (1)
BOND	43200 (2)	0 (0)	0 (0)	0 (0)	22600 (3)
BROWN	0 (0)	0 (0)	0 (0)	0 (0)	1600 (1)
CHRISTIAN	149800 (2)	0 (0)	0 (0)	0 (0)	217900 (6)
CLARK	0 (0)	0 (0)	0 (0)	0 (0)	508400 (4)
CLAY	9765700 (5)	0 (0)	0 (0)	0 (0)	153800 (16)
CLINTON	670000 (7)	0 (0)	0 (0)	0 (0)	274300 (15)
COLES	444800 (2)	0 (0)	0 (0)	0 (0)	13600 (2)
CRAWFORD	2271300 (1)	0 (0)	0 (0)	0 (0)	0 (0)
CUMBERLAND	0 (0)	0 (0)	0 (0)	0 (0)	26600 (3)

NOTE,.THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..ILLINOIS	DISTRICT..00		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
DE WITT	0 (0)	0 (0)	0 (0)	0 (0)	213700 (2)
DOUGLAS	0 (0)	0 (0)	0 (0)	0 (0)	41500 (5)
EDGAR	0 (0)	0 (0)	0 (0)	0 (0)	99400 (2)
EDWARDS	774200 (6)	0 (0)	0 (0)	0 (0)	29500 (6)
EFFINGHAM	5243900 (1)	0 (0)	0 (0)	0 (0)	170200 (10)
FAYETTE	309700 (3)	0 (0)	0 (0)	0 (0)	101900 (1)
FRANKLIN	940100 (8)	0 (0)	0 (0)	0 (0)	253200 (12)
GALLATIN	3224900 (5)	0 (0)	0 (0)	0 (0)	52400 (5)
HAMILTON	2302600 (6)	0 (0)	0 (0)	0 (0)	81000 (3)
HANCOCK	0 (0)	36500 (1)	0 (0)	0 (0)	0 (0)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..ILLINOIS DISTRICT..00

		-SULFUR LEVELS-			
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
JASPER	93300 (2)	0 (0)	0 (0)	0 (0)	58700 (13)
JEFFERSON	655700 (11)	0 (0)	0 (0)	0 (0)	227400 (15)
LAWRENCE	5663100 (3)	0 (0)	0 (0)	0 (0)	107100 (4)
MACON	0 (0)	0 (0)	0 (0)	0 (0)	11400 (4)
MACOUPIN	0 (0)	0 (0)	0 (0)	0 (0)	8200 (3)
MADISON	129400 (2)	0 (0)	0 (0)	0 (0)	19700 (3)
MARION	3892000 (5)	0 (0)	0 (0)	0 (0)	259900 (16)
MONTGOMERY	700 (1)	0 (0)	0 (0)	0 (0)	800 (2)
MOULTRIE	0 (0)	0 (0)	0 (0)	0 (0)	3800 (1)
PERRY	11000 (1)	0 (0)	0 (0)	0 (0)	9600 (2)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..ILLINOIS COUNTY	DISTRICT..00 0-.50	-SULFUR LEVELS- .51-1.00	 1.01-2.00	 OVER 2.00	 NO SULFUR
RANDOLPH	0 (0)	0 (0)	0 (0)	0 (0)	132500 (1)
RICHLAND	185200 (4)	0 (0)	0 (0)	0 (0)	72000 (7)
ST CLAIR	0 (0)	3800 (1)	0 (0)	0 (0)	195000 (1)
SALINE	485000 (1)	0 (0)	0 (0)	0 (0)	194700 (11)
SANGAMON	0 (0)	0 (0)	0 (0)	0 (0)	215000 (9)
SHELBY	34600 (2)	0 (0)	0 (0)	0 (0)	23500 (5)
WABASH	410800 (1)	0 (0)	0 (0)	0 (0)	510900 (10)
WASHINGTON	346000 (4)	0 (0)	0 (0)	0 (0)	321900 (11)
WAYNE	1717700 (8)	0 (0)	0 (0)	0 (0)	333600 (17)
WHITE	5237900 (9)	0 (0)	0 (0)	0 (0)	574400 (17)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,ILLINOIS DISTRICT,,00

		-SULFUR LEVELS-			
COUNTY	0-,50	,51-1,00	1,01-2,00	OVER 2,00	NO SULFUR
WILLIAMSON	0 (0)	0 (0)	0 (0)	0 (0)	134700 (5)
DISTRICT TOTAL	45002600 (102)	40300 (2)	0 (0)	0 (0)	5680500 (254)
STATE TOTAL	45002600 (102)	40300 (2)	0 (0)	0 (0)	5680500 (254)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..INDIANA DISTRICT..00

	-SULFUR LEVELS-				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
CLAY	0 (0)	0 (0)	0 (0)	0 (0)	14752 (4)
DAVIESS	0 (0)	0 (0)	0 (0)	0 (0)	135104 (8)
DUBOIS	0 (0)	0 (0)	0 (0)	0 (0)	54095 (8)
GIBSON	2232660 (5)	0 (0)	0 (0)	0 (0)	913192 (32)
GREENE	0 (0)	0 (0)	0 (0)	0 (0)	79188 (1)
HAMILTON	0 (0)	0 (0)	0 (0)	0 (0)	457952 (1)
KNOX	0 (0)	0 (0)	0 (0)	0 (0)	82105 (7)
MIAMI	0 (0)	0 (0)	0 (0)	0 (0)	164 (1)
PERRY	0 (0)	0 (0)	0 (0)	0 (0)	2929 (3)
PIKE	0 (0)	0 (0)	0 (0)	0 (0)	316628 (12)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..INDIANA

DISTRICT..00

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
POSEY	1314567 (3)	0 (0)	0 (0)	0 (0)	1404354 (32)
SPENCER	0 (0)	0 (0)	0 (0)	0 (0)	304474 (35)
SULLIVAN	1060 (1)	28170 (1)	0 (0)	0 (0)	48167 (2)
VANDERBURGH	0 (0)	0 (0)	0 (0)	0 (0)	339834 (17)
VERMILLION	0 (0)	0 (0)	0 (0)	0 (0)	144 (1)
VIGO	0 (0)	0 (0)	0 (0)	0 (0)	53753 (7)
WABASH	0 (0)	0 (0)	0 (0)	0 (0)	32191 (1)
WARRICK	0 (0)	0 (0)	0 (0)	0 (0)	8382 (4)
DISTRICT TOTAL	3548287 (9)	28170 (1)	0 (0)	0 (0)	4247408 (176)
STATE TOTAL	3548287 (9)	28170 (1)	0 (0)	0 (0)	4247408 (176)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..KANSAS DISTRICT#.01

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
ALLEN	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
ANDERSON	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
BOURBON	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
BROWN	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
BUTLER	3090474 (18)	3858 (1)	0 (0)	0 (0)	827481 (49)
CHAUTAUQUA	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
COFFEY	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
COWLEY	774765 (15)	0 (0)	0 (0)	0 (0)	1632352 (69)
CRAWFORD	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
DICKINSON	0 (0)	0 (0)	0 (0)	0 (0)	6866 (1)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..KANSAS

DISTRICT#.01

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
DOUGLAS	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
ELK	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
FRANKLIN	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
GEARY	0 (0)	0 (0)	0 (0)	0 (0)	420 (1)
GREENWOOD	1617461 (15)	0 (0)	0 (0)	0 (0)	1014971 (32)
JEFFERSON	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
JOHNSON	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
LABETTE	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
LEAVENWORTH	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
LINN	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)

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NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..KANSAS DISTRICT..01

COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
		-SULFUR LEVELS-			
LYON	0 (0)	0 (0)	0 (0)	0 (0)	56591 (3)
MARION	180868 (3)	0 (0)	0 (0)	0 (0)	539715 (16)
MIAMI	387834 (2)	0 (0)	0 (0)	0 (0)	0 (0)
MORRIS	261561 (1)	0 (0)	0 (0)	0 (0)	13072 (2)
NEMAHA	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
NEOSHO	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
RILEY	0 (0)	0 (0)	0 (0)	0 (0)	105346 (1)
WABAUNSEE	248251 (1)	0 (0)	0 (0)	0 (0)	58200 (7)
WILSON	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,KANSAS

		-SULFUR LEVELS-			
COUNTY	0-,50	.51-1,00	1,01-2,00	OVER 2,00	NO SULFUR
	DISTRICT,,01				
WOODSON	193917 (1)	0 (0)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	10245637 (74)	3858 (1)	0 (0)	0 (0)	4255014 (181)
	DISTRICT,,02				
BARTON	1660676 (3)	0 (0)	0 (0)	0 (0)	2913731 (142)
ELLSWORTH	399444 (2)	0 (0)	0 (0)	0 (0)	442244 (14)
MCPHERSON	990516 (5)	0 (0)	0 (0)	0 (0)	713941 (21)
OSBORNE	0 (0)	0 (0)	0 (0)	0 (0)	49100 (3)
RICE	2929158 (4)	555627 (2)	0 (0)	0 (0)	2277913 (41)
RUSSELL	6262038 (5)	934588 (3)	0 (0)	0 (0)	680155 (45)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..KANSAS

COUNTY		-SULFUR LEVELS-			
	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
	DISTRICT..02				
SALINE	0 (0)	0 (0)	0 (0)	0 (0)	285512 (11)
DISTRICT TOTAL	12241827 (19)	1490215 (5)	0 (0)	0 (0)	7362596 (277)
	DISTRICT..03				
BARBER	0 (0)	0 (0)	264000 (1)	0 (0)	558000 (30)
HARPER	0 (0)	0 (0)	0 (0)	0 (0)	414000 (18)
HARVEY	0 (0)	0 (0)	0 (0)	0 (0)	531000 (14)
KINGMAN	1928000 (1)	2224000 (2)	0 (0)	0 (0)	831450 (31)
PRATT	840000 (2)	0 (0)	0 (0)	0 (0)	712000 (34)
RENO	0 (0)	958000 (2)	0 (0)	0 (0)	134000 (18)
SEDGWICK	733000 (4)	0 (0)	0 (0)	0 (0)	611000 (29)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..KANSAS	DISTRICT..03		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
STAFFORD	669000 (4)	1000 (1)	0 (0)	0 (0)	3048000 (136)
SUMNER	93000 (3)	0 (0)	0 (0)	0 (0)	1568900 (58)
DISTRICT TOTAL	4263000 (14)	3183000 (5)	264000 (1)	0 (0)	8408350 (368)
	DISTRICT..04				
CLARK	0 (0)	0 (0)	0 (0)	0 (0)	114000 (2)
COMANCHE	0 (0)	0 (0)	0 (0)	0 (0)	14000 (3)
DECATUR	0 (0)	0 (0)	0 (0)	0 (0)	475000 (23)
EDWARDS	0 (0)	0 (0)	0 (0)	0 (0)	177000 (10)
ELLIS	530000 (2)	3027000 (3)	0 (0)	0 (0)	4647509 (141)
FINNEY	0 (0)	0 (0)	0 (0)	0 (0)	397000 (9)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..KANSAS DISTRICT$.04

COUNTY	-SULFUR LEVELS- 0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
FORD	0 (0)	0 (0)	0 (0)	0 (0)	48000 (2)
GOVE	0 (0)	0 (0)	0 (0)	0 (0)	204000 (8)
GRAHAM	0 (0)	1116000 (2)	0 (0)	0 (0)	2782000 (82)
GRANT	0 (0)	0 (0)	0 (0)	0 (0)	95000 (3)
HAMILTON	0 (0)	0 (0)	0 (0)	0 (0)	4000 (2)
HASKELL	450000 (1)	921000 (1)	0 (0)	0 (0)	658000 (4)
HODGEMAN	501000 (1)	0 (0)	0 (0)	0 (0)	828000 (25)
KEARNY	0 (0)	0 (0)	0 (0)	0 (0)	138000 (7)
KIOWA	0 (0)	0 (0)	0 (0)	0 (0)	602000 (14)
LANE	0 (0)	0 (0)	0 (0)	0 (0)	46000 (4)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..KANSAS DISTRICT..04

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
MEADE	223000 (1)	0 (0)	0 (0)	0 (0)	224738 (9)
MORTON	1715000 (2)	0 (0)	0 (0)	0 (0)	507000 (8)
NESS	15000 (1)	0 (0)	0 (0)	0 (0)	2872000 (54)
NORTON	0 (0)	293000 (1)	0 (0)	0 (0)	103000 (3)
PAWNEE	42000 (2)	0 (0)	0 (0)	0 (0)	946000 (21)
PHILLIPS	538000 (1)	1122000 (1)	0 (0)	0 (0)	469000 (15)
RAWLINS	0 (0)	0 (0)	0 (0)	0 (0)	360000 (11)
ROOKS	429000 (2)	1268000 (5)	0 (0)	0 (0)	2548000 (70)
RUSH	75000 (1)	0 (0)	0 (0)	0 (0)	907000 (25)
SCOTT	0 (0)	17000 (1)	0 (0)	0 (0)	132000 (6)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,KANSAS DISTRICT,,04

COUNTY	0-,50	.51-1,00	1.01-2.00	OVER 2.00	NO SULFUR
			-SULFUR LEVELS-		
SEWARD	0 (0)	349000 (1)	0 (0)	0 (0)	502548 (8)
SHERIDAN	0 (0)	0 (0)	0 (0)	0 (0)	902000 (25)
SHERMAN	0 (0)	0 (0)	0 (0)	0 (0)	12000 (1)
STANTON	0 (0)	0 (0)	0 (0)	0 (0)	12000 (1)
STEVENS	0 (0)	0 (0)	0 (0)	0 (0)	387000 (5)
THOMAS	0 (0)	0 (0)	0 (0)	0 (0)	20000 (2)
TREGO	0 (0)	0 (0)	0 (0)	0 (0)	529000 (26)
DISTRICT TOTAL	4518000 (14)	8113000 (15)	0 (0)	0 (0)	22662795 (629)
STATE TOTAL	31268464 (121)	12790073 (26)	264000 (1)	0 (0)	42688755 (1455)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..KENTUCKY DISTRICT..01

	-SULFUR LEVELS-				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
BRECKINRIDGE	0 (0)	0 (0)	0 (0)	0 (0)	10458 (3)
BUTLER	0 (0)	0 (0)	0 (0)	0 (0)	37591 (6)
CHRISTIAN	109085 (1)	0 (0)	0 (0)	0 (0)	94479 (4)
DAVIESS	6463 (2)	0 (0)	0 (0)	0 (0)	679312 (31)
HANCOCK	0 (0)	0 (0)	0 (0)	0 (0)	13215 (5)
HENDERSON	1803840 (6)	0 (0)	0 (0)	0 (0)	890237 (44)
HOPKINS	3129 (1)	0 (0)	0 (0)	0 (0)	820713 (28)
MCLEAN	17641 (1)	0 (0)	0 (0)	0 (0)	576023 (32)
MUHLENBERG	0 (0)	0 (0)	0 (0)	0 (0)	294396 (23)
OHIO	0 (0)	0 (0)	0 (0)	0 (0)	190329 (23)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..KENTUCKY

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
	DISTRICT..01				
TODD	0 (0)	0 (0)	0 (0)	0 (0)	13538 (2)
UNION	687755 (2)	0 (0)	0 (0)	0 (0)	976513 (15)
WEBSTER	0 (0)	0 (0)	0 (0)	0 (0)	221347 (12)
DISTRICT TOTAL	2627913 (13)	0 (0)	0 (0)	0 (0)	4818151 (228)
	DISTRICT..02				
UNDISTRIBUTED	0 (0)	0 (0)	0 (0)	0 (0)	6016936 (1)
DISTRICT TOTAL	0 (0)	0 (0)	0 (0)	0 (0)	6016936 (1)
STATE TOTAL	2627913 (13)	0 (0)	0 (0)	0 (0)	10835087 (229)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..LOUISIANA DISTRICT..11

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
ASCENSION	1615061 (2)	0 (0)	0 (0)	0 (0)	0 (0)
ASSUMPTION	1323975 (2)	0 (0)	0 (0)	0 (0)	191372 (3)
IBERIA	632027 (1)	0 (0)	0 (0)	0 (0)	253001 (2)
IBERVILLE	5015942 (2)	0 (0)	0 (0)	0 (0)	370818 (3)
JEFFERSON	1964141 (1)	0 (0)	0 (0)	0 (0)	0 (0)
LAFOURCHE	36847171 (12)	0 (0)	0 (0)	0 (0)	2861842 (9)
ST CHARLES	6640960 (3)	0 (0)	0 (0)	0 (0)	72299 (2)
ST JAMES	1322306 (1)	0 (0)	0 (0)	0 (0)	49790 (2)
ST JOHN THE BAPTIST	1282961 (1)	0 (0)	0 (0)	0 (0)	62448 (2)
ST MARTIN	0 (0)	0 (0)	0 (0)	0 (0)	367353 (1)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..LOUISIANA

		-SULFUR LEVELS-			
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
	DISTRICT..11				
TERREBONNE	53025971 (7)	114153 (1)	0 (0)	0 (0)	2785777 (14)
DISTRICT TOTAL	109670514 (32)	114153 (1)	0 (0)	0 (0)	7014700 (38)
	DISTRICT..12				
ACADIA	2492915 (7)	0 (0)	0 (0)	0 (0)	1671085 (16)
AVOYELLES	221497 (1)	0 (0)	0 (0)	0 (0)	124316 (1)
EVANGELINE	608618 (2)	0 (0)	0 (0)	0 (0)	482419 (7)
IBERIA	13459818 (6)	0 (0)	0 (0)	0 (0)	0 (0)
IBERVILLE	2347000 (2)	0 (0)	0 (0)	0 (0)	460588 (2)
LAFAYETTE	0 (0)	0 (0)	0 (0)	0 (0)	203123 (5)
POINTE COUPEE	3889658 (1)	0 (0)	0 (0)	0 (0)	1448257 (10)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,LOUISIANA DISTRICT,,12

COUNTY	0-,50	-SULFUR LEVELS- .51-1,00	1,01-2,00	OVER 2,00	NO SULFUR
RAPIDES	0 (0)	0 (0)	0 (0)	0 (0)	43481 (2)
ST LANDRY	1766414 (4)	0 (0)	0 (0)	0 (0)	737075 (5)
ST MARTIN	8788386 (5)	0 (0)	0 (0)	0 (0)	2762279 (8)
ST MARY	31252291 (11)	0 (0)	0 (0)	0 (0)	572373 (3)
TERREBONNE	0 (0)	0 (0)	0 (0)	0 (0)	268940 (2)
VERMILION	4150644 (6)	0 (0)	0 (0)	0 (0)	2839026 (16)
DISTRICT TOTAL	68977242 (45)	0 (0)	0 (0)	0 (0)	11612962 (77)

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NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..LOUISIANA DISTRICT..13

		-SULFUR LEVELS-			
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
ACADIA	293292 (1)	0 (0)	0 (0)	0 (0)	0 (0)
ALLEN	367075 (1)	0 (0)	0 (0)	0 (0)	649344 (5)
BEAUREGARD	253421 (4)	0 (0)	0 (0)	0 (0)	1367453 (22)
CALCASIEU	3477974 (5)	473049 (1)	0 (0)	0 (0)	1535537 (12)
CAMERON	13212561 (8)	0 (0)	0 (0)	0 (0)	955302 (18)
JEFFERSON DAVIS	3015702 (6)	0 (0)	0 (0)	0 (0)	630299 (10)
DISTRICT TOTAL	20620025 (25)	473049 (1)	0 (0)	0 (0)	5137935 (67)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..LOUISIANA DISTRICT..14

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
ASCENSION	470724 (1)	0 (0)	0 (0)	0 (0)	0 (0)
EAST BATON ROUGE	238045 (1)	0 (0)	0 (0)	0 (0)	559488 (3)
IBERVILLE	615697 (1)	0 (0)	0 (0)	0 (0)	134611 (4)
JEFFERSON	15977389 (4)	0 (0)	0 (0)	0 (0)	4192692 (11)
LAFOURCHE	1953194 (1)	0 (0)	0 (0)	0 (0)	3160 (1)
PLAQUEMINES	92525251 (21)	0 (0)	0 (0)	0 (0)	3907683 (16)
ST BERNARD	0 (0)	0 (0)	0 (0)	0 (0)	1163878 (3)
ST CHARLES	3478922 (1)	0 (0)	0 (0)	0 (0)	309225 (2)
TANGIPAHOA	0 (0)	0 (0)	0 (0)	0 (0)	23489 (1)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..LOUISIANA

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
	DISTRICT..14				
WEST BATON ROUGE	627406 (1)	0 (0)	0 (0)	0 (0)	507916 (3)
DISTRICT TOTAL	115886628 (31)	0 (0)	0 (0)	0 (0)	10802142 (44)
	DISTRICT..21				
JEFFERSON	26780396 (3)	0 (0)	0 (0)	0 (0)	22462604 (2)
LAFOURCHE	2700316 (1)	17340366 (1)	0 (0)	0 (0)	47730081 (5)
TERREBONNE	16953647 (6)	0 (0)	0 (0)	0 (0)	17919658 (12)
DISTRICT TOTAL	46434359 (10)	17340366 (1)	0 (0)	0 (0)	88112343 (19)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..LOUISIANA

COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
	DISTRICT..22	-SULFUR LEVELS-			
IBERIA	11009924 (5)	0 (0)	0 (0)	0 (0)	3151300 (6)
ST MARY	18919763 (8)	4566996 (1)	0 (0)	0 (0)	2299083 (4)
TERREBONNE	0 (0)	0 (0)	0 (0)	0 (0)	565170 (1)
VERMILION	0 (0)	1768666 (1)	0 (0)	0 (0)	4443996 (6)
DISTRICT TOTAL	29929687 (13)	6335662 (2)	0 (0)	0 (0)	10459549 (17)
	DISTRICT..23				
CAMERON	775722 (3)	0 (0)	0 (0)	0 (0)	360400 (5)
DISTRICT TOTAL	775722 (3)	0 (0)	0 (0)	0 (0)	360400 (5)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..LOUISIANA

		-SULFUR LEVELS-			
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
	DISTRICT..24				
PLAQUEMINES	82562507 (10)	0 (0)	0 (0)	0 (0)	48376258 (23)
ST BERNARD	969595 (1)	0 (0)	0 (0)	0 (0)	1030630 (2)
DISTRICT TOTAL	83532102 (11)	0 (0)	0 (0)	0 (0)	49406888 (25)
	DISTRICT..55				
BIENVILLE	0 (0)	0 (0)	0 (0)	0 (0)	68462 (4)
BOSSIER	449072 (1)	587175 (3)	0 (0)	0 (0)	517069 (14)
CADDO	5019750 (5)	0 (0)	0 (0)	0 (0)	126446 (7)
CLAIBORNE	351028 (1)	3228371 (5)	513457 (2)	0 (0)	498825 (12)
CONCORDIA	0 (0)	0 (0)	0 (0)	0 (0)	459800 (1)
DE SOTO	732362 (3)	19337 (1)	0 (0)	0 (0)	77953 (11)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,.1969 (CONTINUED)

STATE,.LOUISIANA DISTRICT,.55

COUNTY	-SULFUR LEVELS- 0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
JACKSON	0 (0)	0 (0)	0 (0)	0 (0)	17871 (2)
LINCOLN	44443 (1)	0 (0)	0 (0)	0 (0)	24463 (2)
NATCHITOCHES	3266942 (1)	0 (0)	0 (0)	0 (0)	25340 (1)
RED RIVER	0 (0)	0 (0)	0 (0)	0 (0)	7754 (2)
SABINE	349553 (3)	0 (0)	0 (0)	0 (0)	220413 (3)
TENSAS	0 (0)	0 (0)	0 (0)	0 (0)	156353 (1)
WEBSTER	1275751 (5)	0 (0)	0 (0)	0 (0)	328496 (3)
WINN	575429 (1)	0 (0)	0 (0)	0 (0)	179106 (5)
DISTRICT TOTAL	12064330 (21)	3834883 (9)	513457 (2)	0 (0)	2708351 (68)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,LOUISIANA

DISTRICT,,56

COUNTY	0-,50	,51-1,00	-SULFUR LEVELS- 1,01-2,00	OVER 2,00	NO SULFUR
AVOYELLES	0 (0)	0 (0)	0 (0)	0 (0)	1278609 (9)
BOSSIER	0 (0)	0 (0)	0 (0)	0 (0)	5386 (1)
CATAHOULA	0 (0)	0 (0)	0 (0)	0 (0)	2756254 (34)
CONCORDIA	2069506 (2)	0 (0)	0 (0)	0 (0)	3881434 (36)
FRANKLIN	103690 (1)	0 (0)	0 (0)	0 (0)	479336 (5)
GRANT	661507 (1)	0 (0)	0 (0)	0 (0)	31853 (2)
LA SALLE	3844803 (5)	0 (0)	0 (0)	0 (0)	2341739 (16)
MOREHOUSE	0 (0)	0 (0)	0 (0)	0 (0)	2042 (1)
OUACHITA	0 (0)	0 (0)	0 (0)	0 (0)	3337 (2)
RAPIDES	1208395 (1)	0 (0)	0 (0)	0 (0)	621345 (3)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,LOUISIANA DISTRICT,,56

COUNTY	0-,50	,51-1,00	-SULFUR LEVELS- 1,01-2,00	OVER 2,00	NO SULFUR
RICHLAND	4531598 (3)	0 (0)	0 (0)	0 (0)	318456 (7)
TENSAS	84278 (1)	0 (0)	0 (0)	0 (0)	588991 (11)
UNION	0 (0)	0 (0)	0 (0)	0 (0)	38825 (2)
DISTRICT TOTAL	12503777 (14)	0 (0)	0 (0)	0 (0)	12347607 (129)
STATE TOTAL	500394385 (205)	28098113 (14)	513457 (2)	0 (0)	197962877 (489)

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NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..MICHIGAN COUNTY	DISTRICT..00 0-.50	-SULFUR LEVELS- .51-1,00	 1.01-2.00	 OVER 2.00	 NO SULFUR
ALLEGAN	70107 (2)	2380 (1)	0 (0)	0 (0)	66188 (10)
ARENAC	0 (0)	159278 (3)	0 (0)	0 (0)	73632 (3)
BARRY	0 (0)	0 (0)	0 (0)	0 (0)	12176 (2)
BAY	219333 (1)	0 (0)	0 (0)	0 (0)	66098 (5)
CALHOUN	6132380 (1)	0 (0)	0 (0)	0 (0)	150 (1)
CASS	0 (0)	0 (0)	0 (0)	0 (0)	1063 (1)
CLARE	49699 (1)	0 (0)	0 (0)	0 (0)	533099 (10)
CRAWFORD	0 (0)	0 (0)	0 (0)	0 (0)	542674 (1)
EATON	0 (0)	0 (0)	0 (0)	0 (0)	340 (1)
GENESEE	0 (0)	0 (0)	0 (0)	0 (0)	2671 (1)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..MICHIGAN DISTRICT..00

		-SULFUR LEVELS-			
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
GLADWIN	118249 (2)	0 (0)	0 (0)	0 (0)	197492 (9)
GRATIOT	0 (0)	0 (0)	0 (0)	0 (0)	11683 (1)
HURON	0 (0)	0 (0)	0 (0)	0 (0)	1882 (2)
ISABELLA	200023 (5)	0 (0)	0 (0)	0 (0)	79366 (6)
JACKSON	0 (0)	0 (0)	0 (0)	0 (0)	71951 (1)
KENT	0 (0)	0 (0)	0 (0)	0 (0)	138400 (3)
LAKE	0 (0)	510722 (1)	0 (0)	0 (0)	194666 (5)
LAPEER	0 (0)	0 (0)	68921 (1)	0 (0)	2524 (1)
LIVINGSTON	0 (0)	0 (0)	0 (0)	0 (0)	734 (1)
MACOMB	0 (0)	0 (0)	0 (0)	0 (0)	7362 (1)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..MICHIGAN

COUNTY	DISTRICT..00 0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
MASON	0 (0)	15583 (1)	0 (0)	0 (0)	67555 (7)
MECOSTA	0 (0)	0 (0)	0 (0)	0 (0)	213944 (3)
MIDLAND	136780 (1)	0 (0)	0 (0)	0 (0)	7763 (4)
MISSAUKEE	268751 (2)	3056 (1)	0 (0)	0 (0)	311526 (4)
MONROE	3171 (1)	0 (0)	0 (0)	0 (0)	0 (0)
MONTCALM	71722 (3)	0 (0)	0 (0)	0 (0)	56996 (9)
MUSKEGON	0 (0)	2751 (1)	0 (0)	0 (0)	51577 (4)
NEWAYGO	1232 (1)	0 (0)	0 (0)	0 (0)	36310 (6)
OCEANA	0 (0)	0 (0)	0 (0)	0 (0)	6550 (3)
OGEMAW	0 (0)	271006 (2)	0 (0)	0 (0)	3203 (2)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..MICHIGAN

DISTRICT..00

COUNTY	-SULFUR LEVELS- 0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
OSCEOLA	40100 (3)	0 (0)	0 (0)	0 (0)	127044 (7)
OTSEGO	0 (0)	0 (0)	0 (0)	0 (0)	12768 (1)
OTTAWA	0 (0)	0 (0)	0 (0)	0 (0)	7354 (4)
PRESQUE ISLE	0 (0)	0 (0)	0 (0)	0 (0)	2017 (1)
ROSCOMMON	0 (0)	0 (0)	0 (0)	0 (0)	93176 (1)
SAGINAW	20059 (2)	0 (0)	0 (0)	0 (0)	19121 (2)
ST CLAIR	0 (0)	203112 (1)	0 (0)	0 (0)	499150 (11)
SHIAWASSEE	0 (0)	0 (0)	0 (0)	0 (0)	17675 (1)
TUSCOLA	0 (0)	0 (0)	0 (0)	0 (0)	49356 (3)
VAN BUREN	0 (0)	0 (0)	0 (0)	0 (0)	8996 (3)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..MICHIGAN DISTRICT[illegible].00

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
WAYNE	0 (0)	0 (0)	0 (0)	0 (0)	24974 (1)
DISTRICT TOTAL	7331606 (25)	1167888 (11)	68921 (1)	0 (0)	3621206 (142)
STATE TOTAL	7331606 (25)	1167888 (11)	68921 (1)	0 (0)	3621206 (142)

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NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..MISSISSIPPI DISTRICT..00

COUNTY	-SULFUR LEVELS- 0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
ADAMS	676328 (13)	0 (0)	0 (0)	0 (0)	6535399 (117)
AMITE	0 (0)	0 (0)	0 (0)	0 (0)	842735 (8)
CLARKE	0 (0)	0 (0)	0 (0)	101083 (1)	10432029 (31)
COVINGTON	0 (0)	0 (0)	0 (0)	0 (0)	817303 (8)
FORREST	0 (0)	0 (0)	0 (0)	0 (0)	12204 (1)
FRANKLIN	0 (0)	0 (0)	0 (0)	0 (0)	4718972 (71)
GREENE	0 (0)	0 (0)	0 (0)	0 (0)	91952 (4)
HINDS	0 (0)	0 (0)	286732 (5)	0 (0)	133088 (3)
JASPER	3676088 (5)	236575 (4)	0 (0)	3596197 (7)	1320128 (29)
JEFFERSON	29878 (1)	0 (0)	0 (0)	0 (0)	510954 (13)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..MISSISSIPPI	DISTRICT..00		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
JONES	0 (0)	0 (0)	631075 (2)	155548 (2)	1881285 (40)
LAMAR	10968 (1)	0 (0)	0 (0)	4903931 (1)	710 (1)
LINCOLN	500766 (2)	1094040 (1)	0 (0)	0 (0)	222216 (3)
MADISON	0 (0)	54082 (1)	444056 (1)	0 (0)	252980 (2)
MARION	338293 (1)	0 (0)	0 (0)	0 (0)	77315 (4)
PEARL RIVER	0 (0)	0 (0)	0 (0)	0 (0)	6620 (2)
PERRY	0 (0)	0 (0)	0 (0)	0 (0)	10688 (1)
PIKE	579279 (1)	0 (0)	0 (0)	0 (0)	500193 (5)
RANKIN	0 (0)	0 (0)	0 (0)	0 (0)	463960 (11)
SCOTT	0 (0)	0 (0)	0 (0)	0 (0)	40481 (2)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..MISSISSIPPI	DISTRICT..00		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
SIMPSON	0 (0)	0 (0)	0 (0)	0 (0)	452807 (12)
SMITH	946274 (1)	0 (0)	0 (0)	0 (0)	4986259 (25)
WAYNE	0 (0)	165676 (1)	0 (0)	1793362 (6)	3034367 (44)
WILKINSON	0 (0)	0 (0)	0 (0)	0 (0)	3482107 (54)
YAZOO	0 (0)	2156519 (1)	0 (0)	0 (0)	209979 (7)
DISTRICT TOTAL	6757874 (25)	3706892 (8)	1361863 (8)	10550121 (17)	41036731 (498)
STATE TOTAL	6757874 (25)	3706892 (8)	1361863 (8)	10550121 (17)	41036731 (498)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,MISSOURI DISTRICT,,00

COUNTY	0-,50	,51-1,00	1,01-2,00	OVER 2,00	NO SULFUR
		-SULFUR LEVELS-			
UNDEFINED	0 (0)	0 (0)	0 (0)	0 (0)	67000 (1)
DISTRICT TOTAL	0 (0)	0 (0)	0 (0)	0 (0)	67000 (1)
STATE TOTAL	0 (0)	0 (0)	0 (0)	0 (0)	67000 (1)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..MONTANA COUNTY	DISTRICT..00 0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
BIG HORN	0 (0)	0 (0)	0 (0)	80571 (2)	41277 (2)
BLAINE	0 (0)	0 (0)	0 (0)	152802 (1)	0 (0)
CARBON	1542 (2)	0 (0)	2440434 (1)	151622 (2)	15125 (2)
CARTER	0 (0)	11785 (1)	0 (0)	0 (0)	0 (0)
DAWSON	858570 (4)	32697 (2)	0 (0)	0 (0)	0 (0)
FALLON	4623698 (4)	2275365 (3)	0 (0)	0 (0)	513925 (4)
GARFIELD	178386 (1)	0 (0)	0 (0)	0 (0)	0 (0)
GLACIER	68800 (1)	270257 (1)	5331785 (3)	0 (0)	29653 (1)
LIBERTY	0 (0)	335635 (3)	0 (0)	0 (0)	0 (0)
MCCONE	555591 (2)	0 (0)	0 (0)	0 (0)	33604 (3)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..MONTANA	DISTRICT..00		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
MUSSELSHELL	152037 (2)	258691 (3)	17 (1)	0 (0)	424310 (8)
PONDERA	0 (0)	0 (0)	1934 (1)	316477 (1)	12512 (2)
POWDER RIVER	13183438 (1)	0 (0)	0 (0)	0 (0)	113502 (2)
RICHLAND	912568 (3)	0 (0)	0 (0)	0 (0)	966947 (3)
ROOSEVELT	1436598 (6)	0 (0)	0 (0)	0 (0)	508592 (8)
ROSEBUD	163661 (1)	673021 (1)	0 (0)	0 (0)	8135 (3)
SHERIDAN	316031 (2)	1616537 (3)	0 (0)	0 (0)	430732 (6)
TETON	0 (0)	0 (0)	0 (0)	1744 (1)	0 (0)
TOOLE	640337 (1)	0 (0)	323633 (2)	0 (0)	67577 (5)
WIBAUX	0 (0)	3550873 (1)	0 (0)	0 (0)	0 (0)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..MONTANA DISTRICT4.00

		-SULFUR LEVELS-			
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
YELLOWSTONE	0 (0)	62776 (1)	7818 (1)	0 (0)	89486 (1)
DISTRICT TOTAL	23091257 (30)	9087637 (19)	8105621 (9)	703216 (7)	3255377 (50)
STATE TOTAL	23091257 (30)	9087637 (19)	8105621 (9)	703216 (7)	3255377 (50)

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NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,.1969 (CONTINUED)

STATE,.NEBRASKA DISTRICT$.00

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
BANNER	560406 (6)	0 (0)	0 (0)	0 (0)	1007475 (64)
CHEYENNE	1132759 (21)	0 (0)	0 (0)	0 (0)	900555 (52)
DUNDY	0 (0)	0 (0)	0 (0)	0 (0)	3590 (2)
FRONTIER	0 (0)	0 (0)	0 (0)	0 (0)	9247 (1)
FURNAS	0 (0)	0 (0)	0 (0)	0 (0)	4182 (2)
GARDEN	0 (0)	0 (0)	0 (0)	0 (0)	12409 (2)
HARLAN	0 (0)	0 (0)	0 (0)	0 (0)	23018 (2)
HITCHCOCK	189584 (1)	0 (0)	0 (0)	0 (0)	30301 (3)
KIMBALL	1428950 (28)	0 (0)	0 (0)	0 (0)	1215280 (91)
LINCOLN	0 (0)	0 (0)	0 (0)	0 (0)	2382 (1)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,NEBRASKA DISTRICT,,00

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
MORRILL	312948 (2)	0 (0)	0 (0)	0 (0)	283787 (14)
RED WILLOW	0 (0)	4032311 (5)	0 (0)	0 (0)	271711 (12)
RICHARDSON	52159 (2)	0 (0)	0 (0)	0 (0)	20642 (2)
SCOTTS BLUFF	455109 (2)	0 (0)	0 (0)	0 (0)	131096 (5)
DISTRICT TOTAL	4131910 (62)	4032311 (5)	0 (0)	0 (0)	3915675 (253)
STATE TOTAL	4131910 (62)	4032311 (5)	0 (0)	0 (0)	3915675 (253)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..NEVADA DISTRICT..00

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
NYE	0 (0)	0 (0)	222634 (1)	0 (0)	0 (0)
DISTRICT TOTAL	0 (0)	0 (0)	222634 (1)	0 (0)	0 (0)
STATE TOTAL	0 (0)	0 (0)	222634 (1)	0 (0)	0 (0)

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NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..NEW MEXICO	DISTRICT..01		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
CHAVES	0 (0)	0 (0)	6549721 (3)	0 (0)	968699 (27)
EDDY	9016831 (7)	5154808 (6)	1364019 (3)	20975 (1)	3711785 (74)
LEA	24319590 (41)	8730790 (12)	13397284 (15)	0 (0)	38880585 (255)
ROOSEVELT	0 (0)	0 (0)	0 (0)	0 (0)	1604212 (11)
DISTRICT TOTAL	33336421 (48)	13885598 (18)	21311024 (21)	20975 (1)	45165281 (367)
	DISTRICT..02				
MCKINLEY	157592 (2)	0 (0)	0 (0)	0 (0)	710190 (4)
RIO ARRIBA	942674 (5)	0 (0)	0 (0)	0 (0)	201212 (4)
SANDOVAL	0 (0)	0 (0)	0 (0)	0 (0)	89360 (4)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..NEW MEXICO DISTRICT..02

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
SAN JUAN	3930182	0	0	0	310034
	(16)	(0)	(0)	(0)	(12)
DISTRICT TOTAL	5030448	0	0	0	1310796
	(23)	(0)	(0)	(0)	(24)
STATE TOTAL	38366869	13885598	21311024	20975	46476077
	(71)	(18)	(21)	(1)	(391)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..NEW YORK DISTRICT..00

		-SULFUR LEVELS-			
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
ALLEGANY	483249 (1)	0 (0)	0 (0)	0 (0)	0 (0)
CATTARAUGUS	755011 (1)	0 (0)	0 (0)	0 (0)	0 (0)
CHAUTAUQUA	0 (0)	0 (0)	0 (0)	0 (0)	17400 (1)
DISTRICT TOTAL	1238260 (2)	0 (0)	0 (0)	0 (0)	17400 (1)
STATE TOTAL	1238260 (2)	0 (0)	0 (0)	0 (0)	17400 (1)

NCTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..NORTH DAKOTA DISTRICT 0.00

COUNTY	-SULFUR LEVELS- 0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
BILLINGS	1869514 (4)	0 (0)	200759 (1)	0 (0)	2725 (1)
BOTTINEAU	207722 (2)	1597386 (12)	25348 (2)	1276074 (4)	55428 (6)
BOWMAN	0 (0)	479462 (1)	0 (0)	0 (0)	161623 (4)
BURKE	651986 (3)	1404826 (18)	0 (0)	0 (0)	9248 (2)
DIVIDE	0 (0)	59531 (3)	0 (0)	0 (0)	104998 (3)
DUNN	18104 (1)	0 (0)	0 (0)	0 (0)	0 (0)
GOLDEN VALLEY	0 (0)	0 (0)	0 (0)	0 (0)	39023 (1)
MCHENRY	0 (0)	0 (0)	0 (0)	25153 (1)	0 (0)
MCKENZIE	3854035 (17)	701206 (2)	0 (0)	0 (0)	61607 (3)
MOUNTRAIL	0 (0)	85671 (2)	0 (0)	0 (0)	0 (0)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..NORTH DAKOTA DISTRICT..00

	-SULFUR LEVELS-				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
RENVILLE	0 (0)	0 (0)	67737 (1)	1087133 (4)	132983 (4)
SLOPE	0 (0)	0 (0)	0 (0)	0 (0)	67614 (1)
STARK	1413420 (3)	0 (0)	0 (0)	0 (0)	36858 (1)
WARD	0 (0)	0 (0)	371281 (1)	0 (0)	0 (0)
WILLIAMS	6418378 (13)	144653 (2)	0 (0)	0 (0)	121811 (4)
DISTRICT TOTAL	14433159 (43)	4472735 (33)	665125 (5)	2388360 (9)	793918 (30)
STATE TOTAL	14433159 (43)	4472735 (33)	665125 (5)	2388360 (9)	793918 (30)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,.1969 (CONTINUED)

STATE,.OHIO COUNTY	DISTRICT,.00 0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
UNDEFINED	0 (0)	0 (0)	0 (0)	0 (0)	3373559 (1)
ALLEN	0 (0)	30000 (1)	0 (0)	0 (0)	0 (0)
MONROE	2936000 (1)	0 (0)	0 (0)	0 (0)	0 (0)
MORROW	1565000 (1)	0 (0)	0 (0)	0 (0)	0 (0)
WASHINGTON	3067000 (1)	0 (0)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	7568000 (3)	30000 (1)	0 (0)	0 (0)	3373559 (1)
STATE TOTAL	7568000 (3)	30000 (1)	0 (0)	0 (0)	3373559 (1)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,OKLAHOMA

COUNTY	DISTRICT,,01 0-,50	.51-1,00	-SULFUR LEVELS- 1,01-2,00	OVER 2,00	NO SULFUR
LINCOLN	1866000 (7)	2000 (1)	211000 (2)	0 (0)	1379000 (45)
PAWNEE	751000 (4)	0 (0)	0 (0)	0 (0)	1034305 (31)
PAYNE	830000 (5)	0 (0)	0 (0)	0 (0)	1466000 (50)
DISTRICT TOTAL	3447000 (16)	2000 (1)	211000 (2)	0 (0)	3879305 (126)
	DISTRICT,,02				
CREEK	9805000 (9)	0 (0)	0 (0)	0 (0)	1772000 (31)
DISTRICT TOTAL	9805000 (9)	0 (0)	0 (0)	0 (0)	1772000 (31)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,OKLAHOMA

COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
	DISTRICT,,03				
MUSKOGEE	444000 (2)	0 (0)	0 (0)	0 (0)	73000 (6)
OKFUSKEE	396000 (6)	0 (0)	0 (0)	0 (0)	885000 (40)
OKMULGEE	881000 (8)	0 (0)	0 (0)	0 (0)	327000 (11)
TULSA	296000 (5)	0 (0)	0 (0)	0 (0)	314000 (8)
WAGONER	0 (0)	0 (0)	0 (0)	0 (0)	146000 (11)
DISTRICT TOTAL	2017000 (21)	0 (0)	0 (0)	0 (0)	1745000 (76)
	DISTRICT,,04				
ALFALFA	980000 (1)	0 (0)	0 (0)	0 (0)	89000 (8)
BEAVER	694000 (2)	0 (0)	0 (0)	0 (0)	6215624 (45)
BLAINE	0 (0)	0 (0)	0 (0)	0 (0)	27000 (2)

-SULFUR LEVELS-

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..OKLAHOMA DISTRICT..04

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
CIMARRON	0 (0)	0 (0)	0 (0)	0 (0)	1157000 (5)
DEWEY	3455000 (1)	0 (0)	0 (0)	0 (0)	757000 (10)
ELLIS	0 (0)	0 (0)	0 (0)	0 (0)	428000 (4)
HARPER	146000 (1)	0 (0)	0 (0)	0 (0)	302000 (9)
MAJOR	3272000 (1)	0 (0)	0 (0)	0 (0)	1575000 (13)
ROGER MILLS	0 (0)	0 (0)	0 (0)	0 (0)	118000 (1)
TEXAS	8052000 (3)	0 (0)	0 (0)	0 (0)	2675677 (26)
WOODS	0 (0)	0 (0)	0 (0)	0 (0)	1403000 (5)
WOODWARD	0 (0)	0 (0)	0 (0)	0 (0)	271000 (3)
DISTRICT TOTAL	16599000 (9)	0 (0)	0 (0)	0 (0)	15018301 (131)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..OKLAHOMA	DISTRICT..05		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
HUGHES	47328 (2)	0 (0)	0 (0)	0 (0)	1309142 (27)
POTTAWATOMIE	1990243 (9)	20759 (1)	0 (0)	0 (0)	1165073 (49)
SEMINOLE	5752797 (15)	290396 (2)	0 (0)	0 (0)	726137 (32)
DISTRICT TOTAL	7790368 (26)	311155 (3)	0 (0)	0 (0)	3200352 (108)
	DISTRICT..06				
ATOKA	0 (0)	0 (0)	0 (0)	0 (0)	2000 (2)
BRYAN	0 (0)	0 (0)	0 (0)	0 (0)	171000 (3)
COAL	0 (0)	0 (0)	0 (0)	0 (0)	287000 (6)
MARSHALL	1616000 (4)	0 (0)	0 (0)	0 (0)	309000 (4)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,OKLAHOMA

COUNTY	0-,50	,51-1,00	-SULFUR LEVELS- 1,01-2,00	OVER 2,00	NO SULFUR
	DISTRICT,,06				
PONTOTOC	4627000 (2)	0 (0)	0 (0)	0 (0)	825000 (14)
DISTRICT TOTAL	6243000 (6)	0 (0)	0 (0)	0 (0)	1594000 (29)
	DISTRICT,,07				
CANADIAN	0 (0)	0 (0)	0 (0)	0 (0)	112000 (5)
GARFIELD	1115000 (1)	0 (0)	0 (0)	0 (0)	1514000 (26)
GRANT	187000 (3)	0 (0)	0 (0)	0 (0)	864000 (24)
KAY	1398000 (8)	0 (0)	0 (0)	0 (0)	1806000 (28)
KINGFISHER	18710000 (1)	0 (0)	0 (0)	0 (0)	2075000 (17)
LOGAN	758900 (8)	0 (0)	0 (0)	0 (0)	622000 (37)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,OKLAHOMA

COUNTY	0-,50	,51-1,00	-SULFUR LEVELS- 1,01-2,00	OVER 2,00	NO SULFUR
	DISTRICT,,07				
NOBLE	735000 (6)	0 (0)	0 (0)	0 (0)	976000 (36)
DISTRICT TOTAL	22903900 (27)	0 (0)	0 (0)	0 (0)	7969000 (173)
	DISTRICT,,08				
CLEVELAND	468845 (2)	0 (0)	0 (0)	0 (0)	4059648 (38)
OKLAHOMA	3168026 (4)	0 (0)	0 (0)	0 (0)	1172117 (21)
DISTRICT TOTAL	3636871 (6)	0 (0)	0 (0)	0 (0)	5231765 (59)
	DISTRICT,,09				
NOWATA	3104000 (2)	0 (0)	0 (0)	0 (0)	0 (0)
OSAGE	12979020 (54)	0 (0)	0 (0)	0 (0)	1738031 (92)
ROGERS	311000 (1)	0 (0)	0 (0)	0 (0)	0 (0)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..OKLAHOMA

DISTRICT..09

COUNTY	0-.50	-SULFUR LEVELS- .51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
WASHINGTON	1202000 (2)	0 (0)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	17596020 (59)	0 (0)	0 (0)	0 (0)	1738031 (92)
DISTRICT..10					
CARTER	111271 (2)	41480661 (7)	0 (0)	0 (0)	781121 (14)
GARVIN	17720448 (7)	0 (0)	0 (0)	0 (0)	2347596 (31)
LOVE	479898 (2)	0 (0)	0 (0)	0 (0)	1016282 (12)
MCCLAIN	3930998 (4)	0 (0)	0 (0)	0 (0)	1263804 (32)
MURRAY	34309 (1)	0 (0)	0 (0)	0 (0)	830518 (8)
DISTRICT TOTAL	22276924 (16)	41480661 (7)	0 (0)	0 (0)	6239321 (97)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,.1969 (CONTINUED)

STATE,.OKLAHOMA DISTRICT,.11

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
BECKHAM	136781 (1)	2001 (1)	0 (0)	0 (0)	85766 (4)
CADDO	6353873 (2)	0 (0)	0 (0)	0 (0)	231154 (6)
COMANCHE	0 (0)	0 (0)	0 (0)	0 (0)	48048 (6)
COTTON	0 (0)	587144 (2)	0 (0)	0 (0)	132390 (6)
GRADY	1349429 (1)	265386 (1)	0 (0)	0 (0)	1776524 (13)
GREER	0 (0)	0 (0)	0 (0)	0 (0)	6870 (3)
JACKSON	0 (0)	0 (0)	0 (0)	0 (0)	158600 (6)
JEFFERSON	0 (0)	0 (0)	0 (0)	0 (0)	65431 (6)
KIOWA	0 (0)	492 (1)	0 (0)	0 (0)	57105 (4)
STEPHENS	0 (0)	0 (0)	0 (0)	0 (0)	1034714 (23)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,.1969 (CONTINUED)

STATE,.OKLAHOMA DISTRICT,.11

	-SULFUR LEVELS-				
COUNTY	0-,50	.51-1,00	1.01-2,00	OVER 2,00	NO SULFUR
TILLMAN	6758 (1)	0 (0)	0 (0)	0 (0)	263735 (6)
WASHITA	0 (0)	0 (0)	0 (0)	0 (0)	5195 (4)
DISTRICT TOTAL	7846841 (5)	855023 (5)	0 (0)	0 (0)	3865532 (87)
STATE TOTAL	120161924 (200)	42648839 (16)	211000 (2)	0 (0)	52252607 (1009)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..PENNSYLVANIA DISTRICT..00

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
UNDEFINED	0 (0)	0 (0)	0 (0)	0 (0)	2180000 (2)
MCKEAN	2698000 (1)	0 (0)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	2698000 (1)	0 (0)	0 (0)	0 (0)	2180000 (2)
STATE TOTAL	2698000 (1)	0 (0)	0 (0)	0 (0)	2180000 (2)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,SOUTH DAKOTA DISTRICT,,00

COUNTY	0-.50	.51-1,00	-SULFUR LEVELS- 1.01-2,00	OVER 2,00	NO SULFUR
CUSTER	0 (0)	0 (0)	0 (0)	0 (0)	8356 (1)
HARDING	0 (0)	149832 (1)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	0 (0)	149832 (1)	0 (0)	0 (0)	8356 (1)
STATE TOTAL	0 (0)	149832 (1)	0 (0)	0 (0)	8356 (1)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,TENNESSEE DISTRICT,,00

COUNTY	-SULFUR LEVELS- 0-,50	.51-1,00	1.01-2,00	OVER 2,00	NO SULFUR
UNDEFINED	0 (0)	0 (0)	0 (0)	0 (0)	31532 (1)
DISTRICT TOTAL	0 (0)	0 (0)	0 (0)	0 (0)	31532 (1)
STATE TOTAL	0 (0)	0 (0)	0 (0)	0 (0)	31532 (1)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,TEXAS DISTRICT,,10

	-SULFUR LEVELS-				
COUNTY	0-,50	,51-1,00	1,01-2,00	OVER 2,00	NO SULFUR
ATASCOSA	849570 (2)	1681969 (4)	0 (0)	0 (0)	1440742 (59)
BASTROP	94869 (2)	0 (0)	0 (0)	0 (0)	6286 (6)
BEXAR	25859 (1)	0 (0)	124778 (2)	0 (0)	281080 (9)
CALDWELL	94478 (2)	4336392 (4)	0 (0)	0 (0)	182276 (12)
DIMMIT	0 (0)	0 (0)	0 (0)	0 (0)	352912 (30)
EDWARDS	0 (0)	0 (0)	0 (0)	0 (0)	18011 (2)
FRIO	655714 (1)	16914 (1)	233007 (2)	83183 (1)	68881 (9)
GONZALES	0 (0)	0 (0)	0 (0)	0 (0)	42972 (12)
GUADALUPE	0 (0)	2176111 (2)	0 (0)	0 (0)	91816 (9)
LA SALLE	0 (0)	0 (0)	0 (0)	0 (0)	252153 (20)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,TEXAS DISTRICT#,10

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
MCMULLEN	455267 (4)	0 (0)	0 (0)	0 (0)	731279 (44)
MAVERICK	1083906 (1)	0 (0)	0 (0)	0 (0)	140140 (13)
MEDINA	0 (0)	102631 (1)	0 (0)	0 (0)	100090 (3)
MILAM	46407 (1)	0 (0)	0 (0)	0 (0)	107849 (4)
TRAVIS	0 (0)	0 (0)	0 (0)	0 (0)	5976 (3)
VAL VERDE	0 (0)	0 (0)	0 (0)	0 (0)	15423 (2)
WILLIAMSON	19530 (2)	0 (0)	0 (0)	0 (0)	3646 (2)
WILSON	0 (0)	297573 (1)	85391 (1)	0 (0)	448619 (26)
ZAVALA	0 (0)	0 (0)	0 (0)	0 (0)	255243 (22)
DISTRICT TOTAL	3325609 (16)	8611590 (13)	443176 (5)	83183 (1)	4545394 (287)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS

DISTRICT..20

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
BEE	142160 (4)	0 (0)	0 (0)	0 (0)	1311803 (66)
CALHOUN	1049457 (4)	0 (0)	0 (0)	0 (0)	1332083 (52)
DE WITT	1235197 (3)	0 (0)	0 (0)	0 (0)	190126 (23)
GOLIAD	712593 (3)	0 (0)	0 (0)	0 (0)	979818 (59)
JACKSON	18425678 (33)	0 (0)	0 (0)	0 (0)	8020363 (208)
KARNES	2499258 (7)	0 (0)	0 (0)	0 (0)	225339 (23)
LAVACA	0 (0)	0 (0)	0 (0)	0 (0)	212114 (14)
LIVE OAK	627936 (4)	0 (0)	0 (0)	0 (0)	1267557 (65)
REFUGIO	26499308 (35)	342901 (1)	0 (0)	0 (0)	2329494 (90)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS

COUNTY	0-.50	-SULFUR LEVELS- .51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
	DISTRICT..20				
VICTORIA	1955918 (18)	0 (0)	0 (0)	0 (0)	1878937 (126)
DISTRICT TOTAL	53147500 (111)	342901 (1)	0 (0)	0 (0)	17747634 (726)
	DISTRICT..30				
AUSTIN	1681644 (5)	0 (0)	0 (0)	0 (0)	305112 (12)
BRAZORIA	19740325 (21)	0 (0)	0 (0)	0 (0)	2156070 (96)
BRAZOS	0 (0)	0 (0)	0 (0)	0 (0)	67004 (3)
BURLESON	0 (0)	0 (0)	0 (0)	0 (0)	11052 (4)
CHAMBERS	15225465 (17)	0 (0)	0 (0)	0 (0)	5787165 (164)
COLORADO	319099 (2)	0 (0)	0 (0)	0 (0)	343911 (21)
FAYETTE	0 (0)	0 (0)	0 (0)	0 (0)	249739 (22)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS

DISTRICT..30

			-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
FORT BEND	11452597 (10)	0 (0)	0 (0)	0 (0)	1376166 (34)
GALVESTON	7312350 (13)	251736 (1)	0 (0)	0 (0)	1510835 (54)
GRIMES	0 (0)	0 (0)	0 (0)	0 (0)	37481 (1)
HARDIN	3603108 (7)	269840 (2)	0 (0)	0 (0)	3156320 (59)
HARRIS	18503063 (21)	0 (0)	0 (0)	0 (0)	2795491 (75)
HOUSTON	0 (0)	0 (0)	0 (0)	0 (0)	966237 (8)
JASPER	6099 (1)	0 (0)	0 (0)	0 (0)	513984 (35)
JEFFERSON	6262785 (25)	0 (0)	0 (0)	0 (0)	2559839 (89)
LEE	0 (0)	0 (0)	0 (0)	0 (0)	8576 (1)
LIBERTY	6874340 (11)	0 (0)	0 (0)	0 (0)	1886102 (48)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,TEXAS

DISTRICT,,30

COUNTY	0-,50	,51-1,00	-SULFUR LEVELS- 1,01-2,00	OVER 2,00	NO SULFUR
MADISON	0 (0)	0 (0)	0 (0)	0 (0)	340936 (11)
MATAGORDA	2501569 (15)	0 (0)	0 (0)	0 (0)	3912814 (111)
MONTGOMERY	10147889 (5)	0 (0)	0 (0)	0 (0)	194262 (14)
NEWTON	33104 (2)	0 (0)	0 (0)	0 (0)	1228802 (42)
ORANGE	1398647 (3)	0 (0)	0 (0)	0 (0)	217601 (11)
POLK	594681 (5)	516542 (1)	0 (0)	0 (0)	633249 (19)
SAN JACINTO	140152 (1)	0 (0)	0 (0)	0 (0)	50329 (5)
TYLER	0 (0)	0 (0)	0 (0)	0 (0)	983489 (32)
WALKER	0 (0)	0 (0)	0 (0)	0 (0)	6734 (3)
WASHINGTON	242163 (1)	0 (0)	0 (0)	0 (0)	0 (0)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS

COUNTY	DISTRICT..30 0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
WHARTON	4255849 (7)	0 (0)	0 (0)	0 (0)	2608178 (95)
DISTRICT TOTAL	110294920 (172)	1038118 (4)	0 (0)	0 (0)	33907478 (1069)
	DISTRICT..40				
ARANSAS	110036 (8)	0 (0)	0 (0)	0 (0)	1460577 (62)
BROOKS	2745978 (10)	0 (0)	0 (0)	0 (0)	2774908 (95)
CAMERON	0 (0)	0 (0)	0 (0)	0 (0)	9684 (1)
DUVAL	3321512 (15)	0 (0)	0 (0)	0 (0)	3069197 (178)
HIDALGO	0 (0)	2947 (1)	0 (0)	0 (0)	385038 (28)
JIM HOGG	3000608 (6)	6307 (1)	0 (0)	0 (0)	1783072 (55)
JIM WELLS	5222468 (11)	0 (0)	0 (0)	0 (0)	1387755 (133)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS DISTRICT..40

COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
		-SULFUR LEVELS-			
KENEDY	336 (1)	0 (0)	0 (0)	0 (0)	2458176 (68)
KLEBERG	23703502 (16)	0 (0)	0 (0)	0 (0)	2279490 (89)
NUECES	3584295 (23)	0 (0)	0 (0)	0 (0)	4334935 (284)
SAN PATRICIO	5793828 (22)	0 (0)	0 (0)	0 (0)	3281791 (165)
STARR	2415321 (11)	0 (0)	0 (0)	0 (0)	3535383 (197)
WEBB	913194 (5)	0 (0)	0 (0)	0 (0)	589402 (58)
WILLACY	1794512 (2)	0 (0)	0 (0)	0 (0)	522287 (33)
ZAPATA	133438 (1)	0 (0)	0 (0)	0 (0)	351626 (14)
DISTRICT TOTAL	52739021 (131)	9254 (2)	0 (0)	0 (0)	28223321 (1460)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS　　DISTRICT..50

	-SULFUR LEVELS-				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
FALLS	0 (0)	0 (0)	0 (0)	0 (0)	29978 (5)
FREESTONE	29749 (1)	0 (0)	0 (0)	0 (0)	25120 (2)
HENDERSON	79182 (5)	7927 (1)	0 (0)	0 (0)	35318 (5)
HOPKINS	502288 (3)	932385 (2)	0 (0)	0 (0)	227645 (8)
KAUFMAN	137479 (1)	421994 (7)	0 (0)	0 (0)	102172 (10)
LEON	513559 (3)	0 (0)	0 (0)	0 (0)	51983 (5)
LIMESTONE	165537 (3)	0 (0)	0 (0)	0 (0)	2223 (1)
MCLENNAN	0 (0)	0 (0)	0 (0)	0 (0)	2810 (2)
NAVARRO	1256938 (5)	7712 (1)	0 (0)	0 (0)	24757 (6)
ROBERTSON	0 (0)	0 (0)	0 (0)	0 (0)	3972 (2)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

		-SULFUR LEVELS-			
STATE..TEXAS	DISTRICT..50				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
VAN ZANDT	0 (0)	8994093 (2)	48029 (1)	0 (0)	46839 (5)
DISTRICT TOTAL	2684731 (21)	10364111 (13)	48029 (1)	0 (0)	552817 (51)
	DISTRICT..60				
GREGG	57912916 (1)	0 (0)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	57912916 (1)	0 (0)	0 (0)	0 (0)	0 (0)
	DISTRICT..65				
ANDERSON	14596329 (17)	0 (0)	364862 (2)	101977 (1)	1248557 (30)
ANGELINA	0 (0)	0 (0)	0 (0)	0 (0)	769 (1)
BOWIE	0 (0)	0 (0)	0 (0)	0 (0)	16032 (2)
CAMP	567472 (1)	0 (0)	0 (0)	0 (0)	253155 (4)
CASS	1288315 (6)	6160 (1)	0 (0)	0 (0)	526259 (13)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS DISTRICT..65

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
CHEROKEE	111700 (1)	0 (0)	0 (0)	0 (0)	207100 (8)
FRANKLIN	353778 (2)	53357 (1)	0 (0)	4784853 (1)	449133 (5)
GREGG	183459 (1)	0 (0)	0 (0)	0 (0)	101015 (9)
HARRISON	898540 (9)	0 (0)	0 (0)	0 (0)	563939 (47)
HOUSTON	367314 (3)	0 (0)	0 (0)	0 (0)	188109 (12)
MARION	1026280 (4)	0 (0)	0 (0)	0 (0)	534191 (13)
NACOGDOCHES	488 (1)	0 (0)	0 (0)	0 (0)	229655 (2)
PANOLA	2516339 (11)	0 (0)	0 (0)	0 (0)	254283 (20)
RED RIVER	0 (0)	0 (0)	0 (0)	0 (0)	26671 (2)
RUSK	851022 (2)	0 (0)	0 (0)	0 (0)	470106 (30)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS	DISTRICT..65		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
SHELBY	0 (0)	0 (0)	0 (0)	0 (0)	1553 (3)
SMITH	423369 (4)	0 (0)	1821195 (2)	1292187 (1)	509000 (25)
TITUS	0 (0)	0 (0)	0 (0)	692489 (4)	111799 (10)
UPSHUR	669423 (1)	0 (0)	0 (0)	0 (0)	41002 (4)
WOOD	128604 (6)	1538670 (2)	935646 (3)	18973857 (12)	1237941 (52)
DISTRICT TOTAL	23982436 (69)	1598187 (4)	3121703 (7)	25845363 (19)	6970269 (292)
	DISTRICT..70				
BROWN	0 (0)	0 (0)	0 (0)	0 (0)	215521 (3)
CALLAHAN	418739 (2)	0 (0)	0 (0)	0 (0)	1139099 (51)
COLEMAN	307968 (8)	0 (0)	0 (0)	0 (0)	751345 (43)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS DISTRICT..70

COUNTY	-SULFUR LEVELS- 0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
COMANCHE	0 (0)	0 (0)	0 (0)	0 (0)	8268 (6)
EASTLAND	10730 (2)	0 (0)	0 (0)	0 (0)	369725 (15)
ERATH	0 (0)	0 (0)	0 (0)	0 (0)	50378 (2)
FISHER	5605671 (21)	0 (0)	0 (0)	0 (0)	792175 (61)
HASKELL	1167040 (8)	0 (0)	0 (0)	0 (0)	2268712 (77)
JONES	982469 (7)	0 (0)	0 (0)	0 (0)	1695632 (98)
NOLAN	3807525 (18)	0 (0)	0 (0)	0 (0)	1257980 (60)
PALO PINTO	4431 (1)	0 (0)	0 (0)	0 (0)	170286 (22)
PARKER	0 (0)	0 (0)	0 (0)	0 (0)	9370 (3)
SHACKELFORD	221461 (2)	0 (0)	0 (0)	0 (0)	3109343 (121)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS	DISTRICT..70		-SULFUR LEVELS-		
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
STEPHENS	0 (0)	0 (0)	0 (0)	0 (0)	1685752 (82)
STONEWALL	4003236 (12)	0 (0)	0 (0)	0 (0)	2429142 (92)
TAYLOR	87407 (2)	0 (0)	0 (0)	0 (0)	3401665 (98)
THROCKMORTON	0 (0)	0 (0)	0 (0)	0 (0)	1971172 (127)
DISTRICT TOTAL	16616677 (83)	0 (0)	0 (0)	0 (0)	21325565 (961)
	DISTRICT..75				
COKE	3710366 (10)	0 (0)	0 (0)	0 (0)	884809 (36)
CONCHO	0 (0)	0 (0)	0 (0)	0 (0)	195103 (10)
CROCKETT	3159178 (7)	1383390 (3)	665111 (5)	479040 (3)	1966349 (81)
IRION	0 (0)	0 (0)	0 (0)	0 (0)	1091359 (49)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS

DISTRICT..75

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
KIMBLE	0 (0)	0 (0)	0 (0)	0 (0)	232 (1)
MENARD	0 (0)	0 (0)	0 (0)	0 (0)	296081 (14)
NOLAN	0 (0)	0 (0)	0 (0)	0 (0)	70819 (3)
PECOS	0 (0)	0 (0)	0 (0)	0 (0)	353 (1)
REAGAN	1575806 (5)	5953 (1)	0 (0)	0 (0)	954557 (24)
RUNNELS	1011527 (5)	0 (0)	0 (0)	0 (0)	1825714 (186)
SCHLEICHER	1355033 (5)	0 (0)	0 (0)	0 (0)	632633 (34)
STERLING	0 (0)	0 (0)	0 (0)	0 (0)	1666 (1)
SUTTON	0 (0)	0 (0)	0 (0)	0 (0)	569125 (4)
TOM GREEN	1234830 (6)	0 (0)	0 (0)	0 (0)	1091233 (49)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE,.TEXAS COUNTY	DISTRICT..75 0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
UPTON	17455258 (16)	202259 (1)	0 (0)	1035211 (2)	1569152 (58)
DISTRICT TOTAL	29501998 (54)	1591602 (5)	665111 (5)	1514251 (5)	11149185 (551)
	DISTRICT..80				
ANDREWS	42971389 (69)	5550009 (18)	4215868 (4)	14650596 (11)	4363653 (116)
BORDEN	1675186 (1)	0 (0)	0 (0)	0 (0)	255049 (1)
BREWSTER	0 (0)	0 (0)	0 (0)	0 (0)	33 (1)
CRANE	11192098 (17)	4052340 (5)	6344985 (4)	25101273 (6)	5227334 (142)
CROCKETT	0 (0)	0 (0)	0 (0)	0 (0)	77671 (2)
CULBERSON	842683 (1)	0 (0)	0 (0)	0 (0)	72623 (7)
ECTOR	25959666 (31)	3610960 (10)	29188611 (12)	941670 (1)	4944466 (93)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS

DISTRICTS.80

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
GAINES	0 (0)	0 (0)	0 (0)	0 (0)	318289 (1)
GLASSCOCK	6805578 (2)	2110 (1)	0 (0)	0 (0)	613825 (19)
HOWARD	2933981 (4)	0 (0)	11268481 (3)	1264711 (3)	1116329 (34)
LOVING	1962149 (7)	0 (0)	0 (0)	0 (0)	42068 (10)
MARTIN	1262454 (3)	0 (0)	0 (0)	0 (0)	698666 (21)
DLAND	4741061 (8)	0 (0)	0 (0)	0 (0)	1377743 (51)
MITCHELL	25731 (1)	0 (0)	0 (0)	1709174 (2)	311072 (11)
PECOS	1531857 (11)	862365 (9)	10546312 (9)	68335 (1)	2318420 (116)
REEVES	175351 (3)	0 (0)	0 (0)	0 (0)	1358159 (33)
STERLING	0 (0)	29390 (1)	0 (0)	0 (0)	2013259 (41)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
	DISTRICT..80				
UPTON	0 (0)	0 (0)	0 (0)	0 (0)	12382 (1)
WARD	455413 (8)	13234 (1)	16440317 (7)	0 (0)	2130567 (61)
WINKLER	6218813 (6)	5924613 (13)	4748586 (7)	0 (0)	1611861 (62)
DISTRICT TOTAL	108753402 (172)	20045021 (51)	82753160 (46)	43735759 (24)	28863489 (823)
	DISTRICT..85				
BORDEN	6726926 (11)	117716 (1)	0 (0)	0 (0)	690387 (28)
COCHRAN	0 (0)	0 (0)	25343838 (1)	8042110 (3)	356010 (6)
COTTLE	0 (0)	0 (0)	0 (0)	0 (0)	15469 (4)
CROSBY	0 (0)	0 (0)	0 (0)	0 (0)	99415 (4)
DAWSON	3613795 (9)	325487 (1)	0 (0)	3711042 (1)	2071402 (50)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS DISTRICT..85

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
DICKENS	0 (0)	0 (0)	0 (0)	0 (0)	183980 (5)
GAINES	4707652 (5)	2807564 (7)	41356415 (13)	7358452 (6)	3471637 (74)
GARZA	1219962 (7)	1065434 (1)	0 (0)	0 (0)	2301095 (61)
HALE	5348 (1)	0 (0)	0 (0)	3005334 (1)	9322 (2)
HOCKLEY	1808203 (4)	0 (0)	0 (0)	1368564 (4)	588612 (22)
KENT	11089550 (7)	6225938 (2)	0 (0)	0 (0)	1088927 (26)
KING	95710 (1)	600729 (3)	0 (0)	0 (0)	358077 (16)
LAMB	0 (0)	0 (0)	0 (0)	0 (0)	210729 (2)
LUBBOCK	0 (0)	0 (0)	0 (0)	325588 (2)	48439 (3)
LYNN	0 (0)	0 (0)	0 (0)	0 (0)	392640 (11)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS

COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
			-SULFUR LEVELS-		
	DISTRICT..85				
MOTLEY	0 (0)	0 (0)	0 (0)	0 (0)	352471 (2)
SCURRY	44057313 (14)	33338 (1)	785016 (3)	692897 (2)	1032462 (40)
TERRY	2201825 (2)	1506873 (2)	0 (0)	1686736 (1)	667393 (17)
YOAKUM	1922126 (6)	0 (0)	2720275 (4)	5631293 (7)	1469092 (36)
DISTRICT TOTAL	77248410 (67)	12683079 (18)	70205544 (21)	31822016 (27)	15407559 (409)
	DISTRICT..90				
ARCHER	354865 (4)	1707866 (1)	0 (0)	0 (0)	4062934 (106)
BAYLOR	0 (0)	0 (0)	0 (0)	0 (0)	1223282 (19)
CLAY	957176 (7)	0 (0)	0 (0)	0 (0)	2194879 (99)
COOKE	2375608 (8)	1668062 (3)	0 (0)	0 (0)	4612900 (116)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS

DISTRICT..90

COUNTY	-SULFUR LEVELS- 0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
DENTON	0 (0)	0 (0)	0 (0)	0 (0)	24820 (6)
FOARD	342599 (1)	0 (0)	0 (0)	0 (0)	150026 (13)
GRAYSON	2458541 (9)	2188884 (6)	0 (0)	0 (0)	2974620 (142)
HARDEMAN	638023 (6)	0 (0)	0 (0)	0 (0)	380631 (22)
JACK	1756055 (4)	0 (0)	0 (0)	0 (0)	2414977 (156)
KNOX	464284 (1)	828859 (2)	0 (0)	0 (0)	540195 (50)
MONTAGUE	1046573 (9)	0 (0)	0 (0)	0 (0)	2965671 (166)
WICHITA	3405199 (3)	0 (0)	0 (0)	0 (0)	5858268 (26)
WILBARGER	549773 (5)	0 (0)	0 (0)	0 (0)	3076579 (59)
WISE	1168072 (7)	0 (0)	0 (0)	0 (0)	953542 (107)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY.,1969 (CONTINUED)

STATE.,TEXAS

		-SULFUR LEVELS-			
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
	DISTRICT.,90				
YOUNG	124141 (3)	0 (0)	0 (0)	0 (0)	3417331 (180)
DISTRICT TOTAL	15640909 (67)	6393671 (12)	0 (0)	0 (0)	34850655 (1267)
	DISTRICT.,95				
CARSON	2695065 (1)	0 (0)	0 (0)	0 (0)	0 (0)
CHILDRESS	0 (0)	0 (0)	0 (0)	0 (0)	108492 (1)
COLLINGSWORTH	0 (0)	0 (0)	0 (0)	0 (0)	85743 (1)
GRAY	8548478 (1)	0 (0)	0 (0)	0 (0)	5532 (1)
HANSFORD	394106 (3)	0 (0)	0 (0)	0 (0)	695672 (21)
HARTLEY	0 (0)	0 (0)	0 (0)	0 (0)	16645 (1)
HEMPHILL	0 (0)	0 (0)	0 (0)	0 (0)	294624 (13)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS

DISTRICT..95

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
HUTCHINSON	4726196 (1)	0 (0)	0 (0)	0 (0)	161700 (10)
LIPSCOMB	911243 (6)	0 (0)	0 (0)	0 (0)	963645 (30)
MOORE	0 (0)	0 (0)	0 (0)	0 (0)	206251 (2)
OCHILTREE	4826205 (10)	0 (0)	0 (0)	0 (0)	864785 (49)
OLDHAM	0 (0)	0 (0)	0 (0)	0 (0)	109851 (2)
POTTER	0 (0)	0 (0)	0 (0)	0 (0)	31913 (2)
ROBERTS	628622 (2)	0 (0)	0 (0)	0 (0)	688407 (11)
SHERMAN	4902 (2)	0 (0)	0 (0)	0 (0)	6349 (2)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..TEXAS DISTRICT..95

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
WHEELER	1564227 (3)	0 (0)	0 (0)	0 (0)	98477 (1)
DISTRICT TOTAL	24299044 (29)	0 (0)	0 (0)	0 (0)	4338086 (147)
STATE TOTAL	576347573 (993)	62677534 (123)	157236723 (85)	103000572 (76)	207881452 (8043)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,,1969 (CONTINUED)

STATE,,UTAH

COUNTY	0-,50	.51-1,00	-SULFUR LEVELS- 1,01-2,00	OVER 2,00	NO SULFUR
	DISTRICT,,01				
DUCHESNE	1338601 (5)	0 (0)	0 (0)	0 (0)	37128 (2)
SUMMIT	1089832 (1)	0 (0)	0 (0)	0 (0)	0 (0)
UINTAH	5454793 (9)	313460 (1)	0 (0)	0 (0)	619139 (4)
DISTRICT TOTAL	7883226 (15)	313460 (1)	0 (0)	0 (0)	656267 (6)
	DISTRICT,,02				
EMERY	6311 (2)	0 (0)	0 (0)	0 (0)	0 (0)
GARFIELD	0 (0)	0 (0)	1705076 (1)	0 (0)	0 (0)
GRAND	113443 (2)	12033 (2)	0 (0)	0 (0)	0 (0)
SAN JUAN	12795492 (11)	0 (0)	0 (0)	0 (0)	85418 (9)

NOTE,,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..UTAH

COUNTY	DISTRICT..02 0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
WASHINGTON	0 (0)	686 (1)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	12915246 (15)	12719 (3)	1705076 (1)	0 (0)	85418 (9)
STATE TOTAL	20798472 (30)	326179 (4)	1705076 (1)	0 (0)	741685 (15)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY,.1969 (CONTINUED)

STATE,.VIRGINIA DISTRICT,.00

	-SULFUR LEVELS-				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
LEE	842 (1)	0 (0)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	842 (1)	0 (0)	0 (0)	0 (0)	0 (0)
STATE TOTAL	842 (1)	0 (0)	0 (0)	0 (0)	0 (0)

NOTE.,THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..WEST VIRGINIA DISTRICT..00

	-SULFUR LEVELS-				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
UNDEFINED	3105000 (1)	0 (0)	0 (0)	0 (0)	0 (0)
DISTRICT TOTAL	3105000 (1)	0 (0)	0 (0)	0 (0)	0 (0)
STATE TOTAL	3105000 (1)	0 (0)	0 (0)	0 (0)	0 (0)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..WYOMING DISTRICT..00

COUNTY	0-.50	.51-1.00	-SULFUR LEVELS- 1.01-2.00	OVER 2.00	NO SULFUR
ALBANY	43335 (2)	1886 (1)	0 (0)	301504 (3)	0 (0)
BIG HORN	14409 (2)	0 (0)	1233423 (3)	6066643 (7)	51629 (3)
CAMPBELL	22114206 (15)	4951780 (3)	673591 (5)	3952663 (13)	3758109 (67)
CARBON	494248 (9)	0 (0)	1850877 (3)	8738 (1)	14278 (2)
CONVERSE	3554152 (7)	0 (0)	0 (0)	0 (0)	80618 (7)
CROOK	2229912 (10)	0 (0)	0 (0)	1226377 (7)	679885 (14)
FREMONT	456938 (5)	1760872 (3)	1544249 (2)	6470985 (12)	103817 (7)
GOSHEN	0 (0)	0 (0)	0 (0)	0 (0)	6514 (1)
HOT SPRINGS	0 (0)	214054 (1)	1748648 (7)	10677664 (8)	12223 (3)
JOHNSON	2705963 (4)	493098 (2)	876917 (1)	1019180 (3)	104750 (5)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..WYOMING

DISTRICT..00

	-SULFUR LEVELS-				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
LARAMIE	410304 (4)	0 (0)	0 (0)	0 (0)	52530 (3)
LINCOLN	777587 (2)	0 (0)	0 (0)	0 (0)	0 (0)
NATRONA	16326118 (22)	5501 (1)	451184 (2)	336782 (6)	23449 (3)
NIOBRARA	486452 (4)	33819 (1)	0 (0)	395757 (2)	37357 (5)
PARK	47033 (3)	0 (0)	15684728 (6)	21790250 (14)	146735 (3)
SHERIDAN	349992 (2)	0 (0)	0 (0)	0 (0)	203576 (2)
SUBLETTE	2115648 (7)	0 (0)	0 (0)	0 (0)	954140 (5)
SWEETWATER	2497049 (4)	0 (0)	5240750 (1)	0 (0)	59742 (6)
WASHAKIE	2386 (1)	0 (0)	244778 (4)	1741089 (6)	49640 (1)

NOTE..THE NUMBERS IN PARENTHESIS REPRESENT THE NUMBER OF CONTRIBUTING FIELDS

TABLE C-8 CRUDE OIL PRODUCTION BY COUNTY..1969 (CONTINUED)

STATE..WYOMING DISTRICT..00

	-SULFUR LEVELS-				
COUNTY	0-.50	.51-1.00	1.01-2.00	OVER 2.00	NO SULFUR
WESTON	2502483 (9)	0 (0)	1609327 (2)	0 (0)	216263 (7)
DISTRICT TOTAL	57128215 (112)	7461010 (12)	31158472 (36)	53987632 (82)	6555255 (144)
STATE TOTAL	57128215 (112)	7461010 (12)	31158472 (36)	53987632 (82)	6555255 (144)
GRAND TOTAL	1743433272 (2676)	282038843 (416)	300388195 (266)	212393803 (262)	650817361 (13623)

TABLE C- 9 IMPORTS OF RESIDUAL FUEL OIL BY PORT OF ENTRY AND SULFUR LEVEL IN 1968

	≤.30	.31-.50	.51-1.00	1.01-2.00	OVER 2.00	TOTAL
SAN DIEGO	0.	0.	0.	4823.	0.	4823.
BRIDGEPORT	0.	0.	0.	1343137.	2323639.	3666776.
NEW HAVEN	0.	0.	0.	1398716.	12626680.	14025396.
GROTON	0.	0.	110143.	1725746.	1860730.	3696619.
WILMINGTON, DEL.	0.	0.	0.	43710.	211978.	255688.
COCOA BEACH	0.	0.	0.	806812.	0.	806812.
PORT EVERGLADES	0.	0.	601019.	20310.	7162924.	7784253.
MIAMI	0.	0.	0.	0.	845910.	845910.
JACKSONVILLE	0.	0.	0.	3790720.	6187123.	9977843.
PORT ST. JOE	0.	0.	0.	478662.	0.	478662.
TAMPA	0.	0.	0.	1471181.	8233804.	9704985.
KEY WEST	0.	0.	0.	12788.	4509.	17297.
WEST PALM BEACH	0.	0.	0.	0.	3508468.	3508468.
ST. PETERSBURG	0.	0.	0.	0.	5225222.	5225222.
SAVANNAH	0.	0.	0.	368901.	2600649.	2969550.
HONOLULU	0.	0.	0.	0.	742116.	742116.
PORTLAND	0.	0.	0.	1878755.	4793157.	6671912.
WISCASSET	0.	0.	0.	444629.	312148.	756777.
BANGOR	0.	0.	0.	119195.	711440.	830635.
BELFAST	0.	0.	0.	904302.	4877802.	5782104.
PINEY POINT	0.	0.	0.	4159865.	0.	4159865.
BALTIMORE	275575.	849154.	1408397.	6191983.	10571218.	19296327.
NEW BEDFORD	0.	0.	0.	1481798.	3721429.	5203227.
SALEM	0.	0.	0.	1097635.	2051568.	3149203.
BOSTON	0.	0.	619128.	10873875.	26274718.	37767721.
DETROIT	24428.	0.	0.	20863.	0.	45291.
PORTSMOUTH	0.	0.	0.	1287414.	2403618.	3691032.
NEWARK	0.	0.	60109.	837935.	560691.	1458735.
PAULSBORO	0.	0.	130984.	1846967.	1228754.	3206705.
BAYONNE	0.	0.	216859.	1337599.	317936.	1872394.
PERTH AMBOY	138570.	4677427.	9354965.	5276616.	5536708.	24984286.
ALBANY	0.	0.	0.	1816053.	4607805.	6423858.
NIAGRA FALLS	0.	0.	0.	167211.	0.	167211.
RENSSELAER	0.	0.	0.	34539.	118290.	152829.
NEW YORK CITY	276365.	8343712.	26063921.	40062043.	47831399.	122577440.
MASSENA	0.	0.	0.	27810.	591345.	619155.

TABLE C- 9 (CONTINUED)

	≤.30	.31-.50	.51-1.00	1.01-2.00	OVER 2.00	TOTAL
MOREHEAD CITY	0.	0.	0.	56413.	249585.	305998.
WILMINGTON, N.C.	0.	35557.	0.	177682.	2744033.	2957272.
CHESTER	141960.	0.	0.	259439.	2005705.	2407104.
ERIE	0.	0.	0.	19251.	0.	19251.
PHILADELPHIA	246078.	880427.	1464013.	18128618.	9680238.	30399374.
NEWPORT	0.	0.	0.	242290.	22732.	265022.
PROVIDENCE	0.	0.	24335.	2987930.	6459199.	9471464.
CHARLESTON	0.	0.	0.	972628.	4437305.	5409933.
GEURGETOWN	0.	88133.	0.	48360.	1738710.	1875203.
NORFOLK	0.	0.	0.	1832624.	6353174.	8185798.
GRAND TOTAL	1102976.	14874410.	40053873.	116057828.	201734459.	373823546.

TABLE C-10 IMPORTS OF RESIDUAL FUEL OIL BY PORT OF ENTRY AND SULFUR LEVEL IN 1969

	≤.30	.31-.50	.51-1.00	1.01-2.00	OVER 2.00	TOTAL
LOS ANGELES	0.	0.	0.	8080.	0.	8080.
BRIDGEPORT	0.	0.	0.	583093.	6681027.	7264120.
NEW HAVEN	0.	0.	0.	765678.	10232122.	10997800.
GROTON	0.	0.	200725.	3333079.	6718905.	10252709.
WILMINGTON, DEL.	0.	0.	108035.	578312.	1794065.	2480412.
COCOA BEACH	0.	0.	0.	1042362.	0.	1042362.
PORT EVERGLADES	0.	0.	159986.	1005477.	6025816.	7191279.
MIAMI	0.	0.	0.	63034.	489938.	552972.
JACKSONVILLE	0.	0.	24636.	8762017.	5888019.	14674672.
PORT ST. JOE	0.	0.	0.	757253.	206181.	963434.
TAMPA	0.	0.	0.	2102923.	10116328.	12219251.
KEY WEST	0.	0.	0.	46162.	5739.	51901.
WEST PALM BEACH	0.	0.	0.	0.	2840602.	2840602.
ST. PETERSBURG	0.	0.	0.	124590.	6169834.	6294424.
SAVANNAH	0.	0.	3917.	513573.	3393415.	3910905.
HONOLULU	0.	0.	0.	0.	692821.	692821.
PORTLAND	0.	0.	0.	663409.	4910113.	5573522.
WISCASSET	0.	0.	0.	372670.	269010.	641680.
BANGOR	0.	0.	0.	0.	1101689.	1101689.
BELFAST	0.	0.	0.	115144.	5745927.	5861071.
PINEY POINT	0.	0.	2566148.	1752214.	0.	4318362.
BALTIMORE	0.	1116.	3334612.	7346154.	11566958.	22248840.
NEW BEDFORD	0.	0.	0.	915295.	5152036.	6067331.
SALEM	0.	0.	29667.	1101857.	1906866.	3038390.
BOSTON	22680.	0.	0.	9329821.	34475552.	43828053.
DETROIT	0.	0.	21018.	71612.	0.	92630.
PORTSMOUTH	0.	0.	0.	137183.	3713096.	3850279.
PENNSAUKEN	0.	0.	0.	308252.	0.	308252.
NEWARK	0.	0.	696010.	198877.	99660.	994547.
PAULSBORO	0.	0.	0.	622208.	939846.	1562054.
BAYONNE	125240.	360375.	271582.	805770.	2112619.	3675586.
PERTH AMBOY	142693.	1400927.	16866263.	3085938.	1983566.	23479387.
PATTERSON	0.	0.	0.	0.	127680.	127680.
ALBANY	0.	0.	170314.	2891023.	5256203.	8317540.
BUFFALO	0.	0.	287061.	0.	0.	287061.
NIAGRA FALLS	0.	0.	0.	206897.	0.	206897.

TABLE C-10 (CONTINUED)

	≤.30	.31-.50	.51-1.00	1.01-2.00	OVER 2.00	TOTAL
RENSSELAER	0.	0.	0.	0.	152210.	152210.
NEW YORK CITY	2010827.	6718620.	56328183.	27777238.	37218310.	130053178.
MASSENA	0.	0.	0.	33232.	1838308.	1871540.
MOREHEAD CITY	0.	0.	0.	69855.	409985.	479840.
WILMINGTON, N.C.	0.	0.	0.	643951.	3280232.	3924183.
CLEVELAND	0.	0.	0.	0.	36510.	36510.
PORTLAND	0.	0.	0.	0.	1119359.	1119359.
CHESTER	0.	128588.	622361.	0.	3278008.	4028957.
ERIE	0.	0.	0.	0.	36480.	36480.
PHILADELPHIA	0.	632014.	5226821.	18930177.	18635759.	43424771.
NEWPORT	0.	0.	0.	288405.	0.	288405.
PROVIDENCE	0.	0.	54586.	2225401.	8521766.	10801753.
CHARLESTON	0.	0.	0.	1463739.	4908481.	6372220.
GEORGETOWN	0.	0.	0.	422323.	1858974.	2281297.
NORFOLK	0.	0.	0.	3059067.	14949383.	18008450.
GRAND TOTAL	2301440.	9241640.	86971925.	104523345.	236859398.	439897748.

TABLE C-11 IMPORTS OF RESIDUAL FUEL OIL BY COUNTRY OF ORIGIN AND SULFUR LEVEL IN 1968

	≤.30	.31-.50	.51-1.00	1.01-2.00	OVER 2.00	TOTAL
CANADA	24428.	0.	0.	401267.	1583173.	2008868.
MEXICO	0.	0.	0.	0.	4828118.	4828118.
PANAMA	0.	0.	0.	155.	6720.	6875.
BAHAMAS	0.	0.	125798.	0.	0.	125798.
BRITISH W.I.	0.	0.	0.	1155738.	0.	1155738.
TRINIDAD	0.	346363.	1238363.	38242129.	11268002.	51094857.
N.W.I.	0.	0.	4858619.	15177624.	76563452.	96599695.
NORTH AMERICA	24428.	346363.	6222780.	54976913.	94249465.	155819949.
COLOMBIA	0.	0.	154140.	3384697.	0.	3538837.
VENEZUELA	58032.	0.	701529.	49586055.	97349171.	147694787.
ARGENTINA	228331.	3534387.	387094.	445210.	0.	4595022.
SOUTH AMERICA	286363.	3534387.	1242763.	53415962.	97349171.	155828646.
SWEDEN	0.	0.	0.	0.	81660.	81660.
ENGLAND	0.	122295.	5994355.	1482429.	2170798.	9769877.
NETHERLANDS	0.	0.	3480697.	0.	1346019.	4826716.
BELGIUM	0.	0.	501316.	0.	1669927.	2171243.
FRANCE	0.	0.	1457981.	0.	0.	1457981.
WEST GERMANY	0.	0.	0.	0.	88629.	88629.
SPAIN	0.	4213925.	1564437.	123690.	0.	5902052.
ITALY	360293.	3048054.	13928453.	429874.	48300.	17814974.
RUMANIA	0.	92100.	0.	0.	0.	92100.
EUROPE	360293.	7476374.	26927239.	2035993.	5405333.	42205232.
SAUDI ARABIA	0.	0.	0.	0.	357747.	357747.
BAHRAIN	0.	0.	0.	0.	384369.	384369.
ASIA	0.	0.	0.	0.	742116.	742116.
AFRICA	0.	0.	110280.	0.	0.	110280.
ALGERIA	0.	106361.	0.	0.	0.	106361.
IVORY COAST	0.	0.	251782.	0.	0.	251782.

TABLE C-11 (CONTINUED)

	≤.30	.31-.50	.51-1.00	1.01-2.00	OVER 2.00	TOTAL
GABON	0.	0.	0.	102517.	0.	102517.
AFRICA	0.	106361.	362062.	102517.	0.	570940.
VIRGIN IS.	431892.	3410925.	5299029.	5526443.	3988374.	18656663.
US POSSESSIONS	431892.	3410925.	5299029.	5526443.	3988374.	18656663.
GRAND TOTAL	1102976.	14874410.	40053873.	116057828.	201734459.	373823546.

TABLE C-12 IMPORTS OF RESIDUAL FUEL OIL BY COUNTRY OF ORIGIN AND SULFUR LEVEL IN 1969

	≤.30	.31-.50	.51-1.00	1.01-2.00	OVER 2.00	TOTAL
CANADA	0.	0.	139553.	1104293.	2227903.	3471749.
MEXICO	0.	0.	0.	0.	4940005.	4940005.
HONDURAS	0.	0.	0.	0.	45074.	45074.
PANAMA	0.	0.	0.	0.	347324.	347324.
BAHAMAS	0.	0.	190681.	0.	0.	190681.
BRITISH W.I.	0.	0.	0.	0.	381021.	381021.
TRINIDAD	22680.	70370.	6871737.	31467842.	20453482.	58886111.
N.W.I.	0.	134828.	15153703.	12749497.	80143056.	108181084.
NORTH AMERICA	22680.	205198.	22355674.	45321632.	108537865.	176443049.
COLOMBIA	0.	0.	0.	7371750.	673958.	8045708.
VENEZUELA	0.	59396.	5587571.	45692455.	118237964.	169577386.
ARGENTINA	142693.	131285.	109678.	0.	0.	383656.
SOUTH AMERICA	142693.	190681.	5697249.	53064205.	118911922.	178006750.
ENGLAND	0.	646701.	5432664.	0.	478799.	6558164.
NETHERLANDS	0.	110577.	9688561.	342446.	1006647.	11148231.
BELGIUM	121800.	339295.	2067617.	19964.	639909.	3188585.
FRANCE	0.	69905.	2588596.	122202.	0.	2780703.
U.S.S.R.	481151.	0.	151620.	0.	0.	632771.
SPAIN	257192.	2036252.	3464695.	245830.	140244.	6144213.
ITALY	348812.	2998826.	21267887.	537784.	0.	25153309.
YUGOSLAVIA	656146.	888677.	0.	109350.	0.	1654173.
RUMANIA	157386.	1201651.	286240.	0.	42253.	1687530.
EUROPE	2022487.	8291884.	44947880.	1377576.	2307852.	58947679.
SAUDI ARABIA	0.	0.	0.	0.	504623.	504623.
BAHRAIN	0.	0.	0.	0.	188198.	188198.
ASIA	0.	0.	0.	0.	692821.	692821.
ALGERIA	113580.	0.	0.	0.	0.	113580.
IVORY COAST	0.	0.	650990.	172050.	0.	823040.

TABLE C-12 (CONTINUED)

	≤.30	.31-.50	.51-1.00	1.01-2.00	OVER 2.00	TOTAL
GABON	0.	0.	0.	102870.	0.	102870.
SOUTH AFRICA	0.	0.	125922.	0.	0.	125922.
AFRICA	113580.	0.	776912.	274920.	0.	1165412.
VIRGIN IS.	0.	553877.	13194210.	4485012.	6408938.	24642037.
US POSSESSIONS	0.	553877.	13194210.	4485012.	6408938.	24642037.
GRAND TOTAL	2301440.	9241640.	86971925.	104523345.	236859398.	439897748.

APPENDIX D.

Form	
6-1300-MS	Refinery shipments and stocks of fuel oil by sulfur content
6-1300-M	Refinery report
6-1302-M	Bulk terminal stocks of finished petroleum products
6-1302-MS	Bulk terminal stocks of No. 4 and residual fuel oils by sulfur content
6-1303-M	Products pipeline report
6-1311-M	Crude oil stocks
6-1334-A	Capacity of petroleum refineries
6-1337-A	Fuel oil and kerosine sales and inventories

Form 6-1300-M
(August 1970)

B01

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON, D.C. 20240

REFINERY REPORT

O.M.B. No. 42-R0033.
Approval expires January 1973.

INDIVIDUAL COMPANY
DATA—CONFIDENTIAL

The data furnished in this report will be treated in confidence by the Department of the Interior, except that they may be disclosed to defense agencies.

Please separate forms at perforations

An extra copy is provided for your files

(Please correct if name or address has changed.)

Please return one copy of the completed form in the enclosed envelope by the 15th of the month, if possible.
See instructions on reverse.

I. REFINERY STOCKS, RECEIPTS, INPUTS, PRODUCTION AND SHIPMENTS (Report in thousands of barrels of 42 gallons.)

Item Description (1)	Product code (2)	Stocks beginning of month (3)	Receipts during month (4)	Inputs during month (5)	Production during month (6)	Shipments losses and used for refinery fuel during month (7)	Stocks end of month (10)
1. Crude oil (incl. lease condensate)					▨		
(a) Domestic	1312-010				▨		
(b) Foreign	1312-020				▨		
2. Products of natural gas processing plants:					▨		
(a) Propane	1321-231				▨		
(b) Isobutane	1321-233				▨		
(c) Normal butane	1321-235				▨		
(d) Other butanes	1321-236				▨		
(e) Butane-propane mixtures	1321-234				▨		
(f) Natural gasoline and isopentane	1321-220				▨	▨	
(g) Plant condensate	1321-210				▨	▨	
3. Other hydrocarbons and hydrogen consumed as raw materials	1312-090				▨	▨	
4. Unfinished oils	2911-812						
5. Gasoline				▨			
(a) Motor	2911-131			▨			
(b) Aviation	2911-111			▨			
6. Special naphthas (solvents)	2911-051			▨			
7. Jet fuel				▨			

(g) Plant condensate	1321-210						
3. Other hydrocarbons and hydrogen consumed as raw materials	1312-090						
4. Unfinished oils	2911-812						
5. Gasoline							
(a) Motor	2911-131						
(b) Aviation	2911-111						
6. Special naphthas (solvents)	2911-051						
7. Jet fuel							
(a) Naphtha-type	2911-211						
(b) Kerosine-type	2911-213						
8. Kerosine (including range oil)	2911-311						
9. Distillate fuel oil.[1]	2911-411						
10. Residual fuel oil	2911-511						
11. Lubricating oils							
(a) Bright stock	2911-853						
(b) Neutral	2911-855						
(c) Other	2911-859						
12. Asphalt	2911-900						
13. Wax							
(a) Microcrystalline	2911-061						
(b) Crystalline-fully refined	2911-071						
(c) Crystalline-other	2911-081						
14. Petroleum coke							
(a) Marketable	2911-021						
(b) Catalyst	2911-022						
15. Road oil	2911-031						
16. Still gas							
(a) Petrochemical feedstock use	2911-042						
(b) Other use	2911-044						
17. Ethane and/or ethylene - Petrochemical feedstock use	2911-612						
18. Propane and/or propylene							
(a) Petrochemical feedstock use	2911-613						
(b) Other use	2911-653						
19. Butane and/or butylene							
(a) Petrochemical feedstock use	2911-614						
(b) Other use	2911-654						
20. Butane-propane mixtures							
(a) Petrochemical feedstock use	2911-616						
(b) Other use	2911-656						
21. Isobutane (IC_4)- petrochemical feedstock use	2911-615						
22. Naphtha-less than 400° end point - petrochemical feedstock use	2911-822						
23. Other oils-over 400° end point - petrochemical feedstock use	2911-824						
24. Other finished products	2911-098						
25. Overage (column 5) or shortage (column 6)	2911-911						
26. Total	2911-999						

---

[1] End-of-month stocks of distillate fuel oil includes ______ thousand barrels of No. 4 fuel oil.

(OVER)

II. STOCKS OF LIQUEFIED GAS IN UNDERGROUND STORAGE END OF THE MONTH (Include stocks in Section I, Column 10) (Thousands of barrels of 42 gallons)

Product	Code	LPG	Code	LRG
1. Ethane-ethylene			2911-612	
2. Propane-propylene	1321-231		2911-653	
3. Isobutane	1321-233		2911-615	
4. Butane-butylene (including n-butane)	1321-236		2911-654	
5. Butane-propane mixtures	1321-234		2911-656	
Total	1321-230		2911-650	

III. REFINERY RECEIPTS OF CRUDE AND UNFINISHED OILS DURING MONTH BY STATE OR COUNTRY OF PRODUCTION (Thousands of barrels of 42 gallons)

A. RECEIPTS OF CRUDE OIL (Omit intrastate receipts)

	Domestic			Foreign	
Do not use (1)	State (2)	Quantity (Code 1312-010) (3)	Do not use (1)	Country (4)	Quantity (Code 1312-020) (5)
	Total			Total	

B. RECEIPTS OF FOREIGN UNFINISHED OILS

Do not use (1)	Country (4)	Quantity (Code 2911-812) (7)	Do not use (1)	Country (4)	Quantity (Code 2911-812) (7)
				Total	

IV. REFINERY RECEIPTS OF CRUDE OIL DURING MONTH BY METHOD OF TRANSPORTATION (Thousands of barrels of 42 gallons)

	Domestic	

			▨	Total	

IV. REFINERY RECEIPTS OF CRUDE OIL DURING MONTH BY METHOD OF TRANSPORTATION
(Thousands of barrels of 42 gallons)

Method	Domestic		Foreign
	Intrastate	Interstate	
1. Pipeline			
2. Tankers			
3. Barges			
4. Tank cars			
5. Trucks			
Total			

NOTE: For Section I, the following arithmetic check is suggested for each line entry:

For items 1-24, the sum of columns 3, 4, and 6 should equal the sum of columns 5, 7, and 10.

For item 26, the sum of column 5 should equal the sum of column 6.

Shaded columns are to be considered as "zero" entries.

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Signature	Position	Date

B

GPO 859-887

Form 6-1302-M
(February 1971)

B04

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON, D.C. 20240

BULK TERMINAL STOCKS OF FINISHED PETROLEUM PRODUCTS

O.M.B. No. 42-R0036.
Approval expires March 1973.

INDIVIDUAL COMPANY
DATA–CONFIDENTIAL

The data furnished in this report will be treated in confidence by the Department of the Interior, except that they may be disclosed to defense agencies.

(Please correct if name or address has changed.)

Return one copy of the completed form by the 15th of the month in the enclosed envelope, if possible.
See explanatory notes on the reverse of this form.

REPORT ALL FIGURES IN THOUSANDS OF BARRELS

		Gasoline			Jet fuel			Fuel oil					
District (1)	Code	Motor (2)	Aviation (3)	Special naphthas (4)	Naphtha type (5)	Kerosine type (6)	Kerosine (7)	Distillate type (8)	No. 4 (9)	Residual type (10)	Lube oils and greases (11)	Asphalt (12)	Miscellaneous finished oils (13)
East Coast, total [1]	101												
New England	021	▨	▨	▨	▨	▨	▨				▨	▨	▨
Middle Atlantic	031	▨	▨	▨	▨	▨	▨				▨	▨	▨
South Atlantic	041	▨	▨	▨	▨	▨	▨				▨	▨	▨
Appalachian: District 1	102												
District 2	203												
Indiana, Ill., Ky., etc	204												
Minn., Wis., N.Dak., S.Dak.	205												
Okla., Kans., Mo., etc	206												

(Please correct if name or address has changed.)

Return one copy of the completed form by the 15th of the month in the enclosed envelope, if possible.
See explanatory notes on the reverse of this form.

REPORT ALL FIGURES IN THOUSANDS OF BARRELS

District (1)	Code	Gasoline		Special naphthas (4)	Jet fuel		Kerosine (7)	Fuel oil			Lube oils and greases (11)	Asphalt (12)	Miscellaneous finished oils (13)
		Motor (2)	Aviation (3)		Naphtha type (5)	Kerosine type (6)		Distillate type (8)	No. 4 (9)	Residual type (10)			
East Coast, total [1]	101												
New England	021												
Middle Atlantic	031												
South Atlantic	041												
Appalachian: District 1	102												
District 2	203												
Indiana, Ill., Ky., etc	204												
Minn., Wis., N.Dak., S.Dak	205												
Okla., Kans., Mo., etc	206												
Texas Inland	307												
Texas Gulf	308												
Louisiana Gulf	309												
Ark., Inland La., etc	310												
New Mexico	311												
Rocky Mountain	412												
West Coast	513												
TOTAL	999												

[1] New England: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, and Vermont.
Middle Atlantic: Eastern New York, New Jersey, Eastern Pennsylvania, Delaware, Maryland, and District of Columbia.
South Atlantic: Virginia, North Carolina, South Carolina, Georgia, and Florida.

Signature

Position

Date

(OVER)

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EXPLANATORY NOTES

General:

1. Report all figures in THOUSANDS OF BARRELS of 42 gallons.
2. All figures should represent actual physical inventories.
3. Bulk terminals are defined as follows:
   A. All bulk installations which receive their principal products by tankers, barges, or pipelines.
   B. Any other storage point with a combined capacity of 50,000 barrels or more, regardless of the transportation means by which products are received.
4. Stocks.—Report stocks corrected to 60°F. less bottom settlings and water (BS&W). Include all stocks of domestic origin held by your company at bulk terminals and in transit thereto except by pipeline. Include foreign stocks held at bulk terminals only after entry for consumption. Exclude stocks of foreign origin held in bond. Report all stocks held in custody by your company at bulk terminals, regardless of ownership.

Product Descriptions:

1. Gasoline.—Include finished grades of motor and aviation gasoline as well as finished components in the gasoline range which will be blended into finished gasoline.
2. Special naphthas.—Include paint thinners, cleaner's naphthas, and solvents.
3. Jet fuel.—Include aviation turbine engine fuels for military and/or commercial use.
4. Kerosine.—Include range oil.
5. Distillate fuel oil.—Include A.S.T.M. Grades 1 and 2 and distillate type diesel fuel oils. Report A.S.T.M. Grade 4 separately.
6. Residual fuel oil.—Include A.S.T.M. Grade 5, heavy diesel, Navy special and Bunker C fuel oils.
7. Lube oils and greases.—Include all grades of lubricating oils from spindle oil to cylinder oil. The conversion factor for grease is 300 pounds per barrel.
8. Asphalt.—Include cements, fluxes, and cut-back. The conversion factor for asphalt is 5.5 barrels per short ton.
9. Miscellaneous finished oils.—Exclude liquefied petroleum gases.

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Form 6-1302-MS
(September 1970)

B06

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON, D.C. 20240

BULK TERMINAL STOCKS OF NO. 4 AND RESIDUAL FUEL OILS BY SULFUR CONTENT

O.M.B. No. 42-R0036
Approval expires March 1973.

INDIVIDUAL COMPANY DATA–CONFIDENTIAL

The data furnished in this report will be treated in confidence by the Department of the Interior, except that they may be disclosed to defense agencies.

Please separate forms at perforations

An extra copy is provided for your files

(Please correct if name or address has changed.)

Return one copy of the completed form, in the enclosed envelope, by the 15th of the month if possible. See explanatory notes on the reverse of this form.

REPORT ALL FIGURES IN THOUSANDS OF BARRELS

		Stocks of No. 4 fuel oil with sulfur content of - -					Stocks of residual fuel oil with sulfur content of - -				
District (1)	Code	0.5% and under (2)	0.6% to 1.0% (incl.) (3)	1.1% to 2.0% (incl.) (4)	Over 2.0% (5)	Total stocks (6)	0.5% and under (7)	0.6% to 1.0% (incl.) (8)	1.1% to 2.0% (incl.) (9)	Over 2.0% (10)	Total stocks (11)
East Coast, total[1]	101										
New England	021										
Middle Atlantic	031										
South Atlantic	041										
Appalachian: District 1	102										
District 2	203										
Indiana, Ill., Ky., etc.	204										
Minn., Wis., N. Dak., S. Dak.	205										
Okla., Kans., Mo., etc.	206										
Texas Inland	307										
Texas Gulf	308										
Louisiana Gulf	309										
Ark., Inland La., etc.	310										
New Mexico	311										
Rocky Mountain	412										
West Coast	513										
Total	999										

New England: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, and Vermont.
Middle Atlantic: Eastern New York, New Jersey, Eastern Pennsylvania, Delaware, Maryland, and District of Columbia.
South Atlantic: Virginia, North Carolina, South Carolina, Georgia, and Florida.

Signature	Position	Date

(OVER)

273

EXPLANATORY NOTES

1. Report all figures in THOUSANDS OF BARRELS of 42 gallons.
2. All figures should represent actual physical inventories.
3. Bulk terminals are defined as follows:
    - A. All bulk installations which receive their principal products by tankers, barges, or pipelines.
    - B. Any other storage point with a combined capacity of 50,000 barrels or more, regardless of the transportation means by which products are received.
4. Stocks.—Report stocks corrected to 60°F. less bottom settlings and water (BS&W). Include all stocks of domestic origin held by your company at bulk terminals and in transit thereto except by pipeline. Include foreign stocks held at bulk terminals only after entry for consumption. Exclude stocks of foreign origin held in bond. Report all stocks held in custody by your company at bulk terminals, regardless of ownership.

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NOTE: Figures in "Total" columns should agree with those reported on Form 6-1302-M for current reporting month.

Form 6-1303-M
(August 1970)

BO5

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON, D.C. 20240

PRODUCTS PIPELINE REPORT

O.M.B. No. 42-R0038.
Approval expires January 1974.

INDIVIDUAL COMPANY DATA—CONFIDENTIAL

The data furnished in this report will be treated in confidence by the Department of the Interior, except that they may be disclosed to defense agencies.

Please separate forms at perforations →

An extra copy is provided for your files

(Please correct if name or address has changed.)

Please return one copy of the completed form in the enclosed envelope by the 15th of the month, if possible. Product descriptions and instructions for completing this form are contained in an instruction booklet.

NOTE: For Section I, the sum of columns 3 and 4 should equal the sum of columns 7, 8 and 10.

I. STOCKS, RECEIPTS AND SHIPMENTS OF PIPELINE PRODUCTS (Thousands of barrels of 42 gallons)

Products (1)	Product code (2)	Stocks beginning of month (3)	Receipts during month (4)	Shipments during month (7)	Shortage (+) or overage (−) during month (8)	Stocks end of month (10)
1. Gasoline						
(a) Motor	2911-131					
(b) Aviation	2911-111					
2. Jet fuel						
(a) Naphtha-type	2911-211					
(b) Kerosine-type	2911-213					
3. Kerosine	2911-311					
4. Distillate fuel oil	2911-411					
5. Liquefied petroleum gases (incl. LRG)	1321-230					
6. Natural gasoline	1321-220					
7. Plant condensate	1321-210					
8. Other products (specify)						
Total						

(OVER) 275

II. MOVEMENTS OF PETROLEUM PRODUCTS BY PIPELINE DURING MONTH BETWEEN P.A.D. DISTRICTS.

(Thousands of barrels of 42 gallons)

Products	Product code	From P. A. D. 1 to P. A. D. 2	From P. A. D. 2 to P. A. D. 1	From P. A. D. 2 to P. A. D. 3	From P. A. D. 3 to P. A. D. 1	From P. A. D. 3 to P. A. D. 2	From P. A. D. 3 to P. A. D. 4	From P. A. D. 3 to P. A. D. 5	From P. A. D. 4 to P. A. D. 2	From P. A. D. 4 to P. A. D. 5	From P. A. D. _ to P. A. D. _	From P. A. D. _ to P. A. D. _	From P. A. D. _ to P. A. D. _
1. Gasoline													
(a) Motor	2911-131												
(b) Aviation	2911-111												
2. Jet fuel													
(a) Naphtha-type	2911-211												
(b) Kerosine-type	2911-213												
3. Kerosine	2911-311												
4. Distillate fuel oil	2911-411												
5. Liquefied petroleum gas (incl. LRG)	1321-230												
6. Natural gasoline	1321-220												
7. Plant condensate	1321-210												
Total													

III. STOCKS OF PIPELINE PRODUCTS IN LINES AND WORKING TANKS AT END OF MONTH BY REFINERY DISTRICT

(Thousands of barrels of 42 gallons)

Please enter stocks by refinery district code — see instruction booklet

Products	Product code								
1. Gasoline									
(a) Motor	2911-131								
(b) Aviation	2911-111								
2. Jet fuel									
(a) Naphtha-type	2911-211								
(b) Kerosine-type	2911-213								
3. Kerosine	2911-311								
4. Distillate fuel oil	2911-411								
5. Liquefied petroleum gases									
(a) Ethane	1321-110								
(b) Propane	1321-231								
(c) Butane	1321-232								
(d) Butane-propane mix	1321-234								
(e) Isobutane	1321-233								
6. Natural gasoline	1321-220								
7. Plant condensate	1321-210								
Total	....								

Signature

Title

Date

GPO 869-898

Form 6-1311-M
(January 1971)

B09

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON, D.C. 20240

CRUDE OIL STOCKS

O.M.B. No. 42-R0001.
Approval expires March 1973.

INDIVIDUAL COMPANY DATA—CONFIDENTIAL

The data furnished in this report will be treated in confidence by the Department of the Interior, except that they may be disclosed to defense agencies.

(Please correct if name or address has changed.)

Return one copy of the completed form in the enclosed envelope by the 15th of the month, if possible.
See explanatory notes and instructions on the reverse side.

Stocks held in the CUSTODY of your company— ON THE LAST DAY OF ____________

TYPE AND STATE OF ORIGIN	Code	Fill in below the names of the States in which stocks are held. If stocks are held in more than 8 States, please use additional sheets. (Thousands of barrels of 42 gallons)								TOTAL BY ORIGIN
A. Stocks at refineries or in transit thereto:										
Origin:										
Alabama	001									
Alaska	002									
Arizona	004									
Arkansas	005									
California	006									
Colorado	008									
Florida	012									
Illinois	017									
Indiana	018									
Kansas	020									
Kentucky	021									
Louisiana	022									
Michigan	026									
Mississippi	028									
Montana	030									
Nebraska	031									
Nevada	032									
New Mexico	035									
New York	036									
North Dakota	038									
Ohio: 1. Pennsylvania grade	139									
2. Other grades	239									
Oklahoma	040									
Pennsylvania	042									
Texas	048									
Utah	049									
West Virginia	054									
Wyoming	056									
Foreign	081									
Total refinery stocks	059									

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(OVER)

TYPE AND STATE OF ORIGIN	Code	Fill in below the names of the States in which stocks are held. If stocks are held in more than 8 States, please use additional sheets. (Thousands of barrels of 42 gallons)								TOTAL BY ORIGIN
Pipeline and tank-farm stocks (Incl. PL fill):										
Origin:										
Alabama	001									
Alaska	002									
Arizona	004									
Arkansas	005									
California	006									
Colorado	008									
Florida	012									
Illinois	017									
Indiana	018									
Kansas	020									
Kentucky	021									
Louisiana	022									
Michigan	026									
Mississippi	028									
Montana	030									
Nebraska	031									
Nevada	032									
New Mexico	035									
New York	036									
North Dakota	038									
Ohio: 1. Pennsylvania grade	139									
2. Other grades	239									
Oklahoma	040									
Pennsylvania	042									
Texas	048									
Utah	049									
West Virginia	054									
Wyoming	056									
Foreign	081									
Total pipeline and tank-farm stocks	069									
C. Producers' (lease) stocks	079									
Total by location (sum of A, B, and C)	099									

Stocks reported above located in the Texas-Louisiana Gulf Coast area (Code 091): *Bbls.*

EXPLANATORY NOTES

General:

1. Report all figures in THOUSANDS OF BARRELS of 42 gallons.
2. All figures should represent actual physical inventories of crude oil on the last day of the month.
3. Report all stocks of crude oil on a custody basis, regardless of ownership.

Definitions:

1. *Crude oil.*—A mixture of hydrocarbons that existed in the liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Include field condensate and drips but exclude topped crude and other unfinished oils. Exclude natural gas liquids produced at natural gas processing plants and mixed with crude oil.
2. *Stocks.*—Report stocks corrected to 60°F. less bottom settlings and water (BS&W).

Instructions for Completing Form 6-1311-M:

SECTION A:

1. Include all crude oil stocks of domestic origin held at refineries and in transit thereto except by pipeline. Include as stocks of foreign origin, only those that have cleared customs or for which duty has been paid. Exclude stocks of foreign origin held in bonded storage.
2. Total refinery stocks of crude oil at the end of the month shown on this report should be the same as those reported on lines 1(a) and 1(b) of Form 6-1300-M, "Refinery Report."

SECTION B:

Include all crude oil stocks of domestic origin held in tank farms operated by the reporting company, including pipeline fill and stocks in working tanks of pipelines. Include as stocks of foreign origin only those that have cleared customs or for which duty has been paid. Exclude stocks of foreign origin held in bonded storage.

SECTION C:

Report end-of-month stocks of crude oil held in tanks on leases operated by the reporting company.

Signature	Title	Date

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GPO 832-756

Form 6-1334-A
(July 1969)

B19

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON, D.C. 20240

CAPACITY OF PETROLEUM REFINERIES

Budget Bureau No. 42-R0035.
Approval expires March 1972.

INDIVIDUAL COMPANY DATA–CONFIDENTIAL

Unless authorization is granted in the section above the signature, the data furnished in this report will be treated in confidence by the Department of the Interior, except that they may be disclosed to defense agencies.

(Please correct if name or address has changed.)

Return one copy of the completed form in the enclosed envelope. See instructions on other side.

Section I. Identification

1. Location of refinery *(nearest town)* ____
2. Type of plant *(check one or more)* ☐ Skimming ☐ Cracking ☐ Asphalt ☐ Coking ☐ Lube ☐ Wax
   Other *(specify)* ____
3. If idle, give approximate date of last operations ____
4. If building, or temporarily idle, give approximate date operations will begin ____
5. If your plant has been sold (or leased), give name and address of present operators ____

Section II. Capacity of refining facilities as of January 1:

(Barrels per calendar day)

Process	Operating (1)	Shutdown		Building		Fresh feed *(Operating and shutdown)* (6)
		Operable (2)	Inoperable (3)	Replacement (4)	Addition (5)	
A. Crude oil distillation						▨
B. Reforming and Cracking:	(For Columns 1 – 5 report in terms of gasoline output)					▨
Catalytic cracking						
Catalytic reforming						
Hydrocracking						
Coking						
Thermal cracking						
Thermal reforming						
Alkylation						

Section III. Storage capacity *(shell)* at this location as of January 1:

(1,000 barrels)

A. Crude oil ____
B. Finished products:
Motor gasoline ____
Jet fuel (all grades) ____
Middle distillates ____
Residual fuel oils ____

May the Bureau of Mines disclose your individual data shown only in Sections I and II in its publication, "Petroleum Refining Capacity in the United States and Puerto Rico"?

☐ Yes ☐ No

Signature	Title	Date

OVER

INSTRUCTIONS

1. Capacity is the maximum daily average number of barrels of crude oil or feedstock that can be charged to a unit allowing for normal maintenance downtime.

2. Shutdown facilities requiring extensive reconditioning should be reported as inoperable. Report all other shutdown facilities as operable.

3. Crude oil capacity should be based on (1) charging the types of crude oil available, or expected to be available, (2) charging crude oil only, not mixtures of crude oil and lighter products such as natural gas liquids, and (3) normal yearly average operations when processing crude oil to the kinds of products generally manufactured. If some crude oil is consistently charged to cracking units, please include in the crude oil capacity the daily amount of such charge and footnote the amount so included.

4. In Section II, quantities reported as fresh feed capacity should be greater than the sum of gasoline output capacity reported as operating (Col. 1) and shutdown (Cols. 2 and 3) for each process, except hydrocracking where fresh feed capacity may be greater than, equal to, or less than the gasoline output capacity.

5. Gasoline output capacity represents the daily average amount of C_5 to 400 E.P. gasoline that can be produced under maximum sustained throughput of charging stocks as reported in Section II, (Col. 6).

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Form 6–1337–A
(July 1970)

B23

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON, D.C. 20240

FUEL OIL AND KEROSINE SALES AND INVENTORIES

O.M.B. No. 42-R0030.
Approval expires November 1973.

INDIVIDUAL COMPANY DATA—CONFIDENTIAL

The data furnished in this report will be treated in confidence by the Department of the Interior, except that they may be disclosed to defense agencies.

Please separate forms at perforations →

An extra copy is provided for your files

(Please correct if name or address has changed.)

SEE INSTRUCTIONS AND DEFINITIONS ON REVERSE SIDE

1. Sales of fuel oil and kerosine during the year by States of destination and by uses.

(Insert names of States in column headings) →				
Type and use (1)	Code 2911-	Barrels of 42 gals. (2)	Barrels of 42 gals. (3)	Barrels of 42 gals. (4)
A. Distillate-type fuel oils:				
1. Direct sales to consumers by your company for—				
a. Heating:				
(1) Grade #1 for automatic burners	400			
(2) Grade #1 for all other heating	410			
(3) Grade #2	420			
(4) Grade #4	440			
b. Industrial use	401			
c. Oil-company use (including own use)	402			
d. Railroad use	403			
e. Vessel bunkering	404			
f. Military use	405			
g. Electric utility companies	406			
h. On-highway diesel use	430			
i. Off-highway diesel use (construction equipment, etc.)	431			
j. All other uses	408			
2. Sales to dealers, resellers, and refiners	409			
3. Total (sum of A1 and A2)	411			
B. Residual-type fuel oils:				
1. Direct sales to consumers by your company for—				
a. Heating:				
(1) Grade #5	550			
(2) Grade #6	560			
b. Industrial use	501			
c. Oil-company use (including own use)	502			
d. Railroad use	503			
e. Vessel bunkering	504			
f. Military use	505			
g. Electric utility companies	506			
h. All other uses	508			
2. Sales to dealers, resellers, and refiners	509			
3. Total (sum of B1 and B2)	511			
C. Kerosine:				
1. Direct sales to consumers by your company for—				
a. Heating	300			
b. All other uses (excluding jet fuel)	308			
2. Sales to dealers, resellers, and refiners	309			
3. Total (sum of C1 and C2)	311			
D. Total all sales (sum of A3, B3, and C3)	999			

(OVER) 281

II. Inventories of fuel oils and kerosine.

(Insert names of States in column headings) →				
Inventories by type (1)	Code 2911-	Barrels of 42 gals. (2)	Barrels of 42 gals. (3)	Barrels of 42 gals. (4)
A. Beginning-of-year:				
1. Distillate-type fuel oil (including diesel)	477			
2. Residual-type fuel oil (including heavy diesel)	577			
3. Kerosine (excluding jet fuel)	377			
B. End-of-year:				
1. Distillate-type fuel oil (including diesel)	488			
2. Residual-type fuel oil (including heavy diesel)	588			
3. Kerosine (excluding jet fuel)	388			

If this company changed ownership during the year, please report name and address of present owner, and date sold:

(Name) (Address) (Date sold)

Signature

Title

Date

INSTRUCTIONS FOR COMPLETING THIS FORM

Report all figures in barrels of 42 gallons.

Companies which sold less than 10,000 barrels (420,000 gallons) of fuel oil and kerosine during the year are not requested to complete this form. Form should be so noted and returned.

This report of the distribution of your sales should cover all light and heavy fuel oils and kerosine sold during the year. Include all domestic sales of these products, whether purchased or of your own manufacture. Report sales by State of destination and inventories by State of location. A consolidated report covering all your company's fuel-oil and kerosine sales and inventories will be acceptable.

Please return one copy of the completed form by April 15. Before submitting the report, please compare it with the previous year's report and verify any inconsistencies such as the addition or elimination of states or products and any sizable differences in quantity data between the two years.

DEFINITIONS

DISTILLATE-TYPE FUEL OIL.—Include ASTM grades 1, 2, and 4 and distillate-type diesel fuel oil.

RESIDUAL-TYPE FUEL OIL.—Include ASTM grades 5 and 6, heavy diesel, Navy special and Bunker C oils used for generation of heat and/or power. Include acid sludge and pitch used for refinery fuel.

KEROSINE.—Include petroleum distillates suitable for use as an illuminant when burned in a wick lamp and kerosine sold for range oil.

HEATING.—Report all fuel oils used for heating purposes.

INDUSTRIAL USE (excluding heating and oil-company uses).—Report under this item all fuel oil sold to mines, smelters, and plants engaged in producing manufactured products.

OIL-COMPANY USE.—Report all fuel oil, crude oil, or acid sludge used as fuel at your refineries, by your pipelines, or in your field operations. However, oil sold to other oil companies or used by your own company to heat buildings and operate marine equipment should be reported under the proper categories. Sales to other oil companies for field use should be included but exclude sales for use as refinery charging stocks.

RAILROAD USE.—Include all fuel oil sold to railroads, except that used for heating buildings operated by railroads which should be reported as sales for "Heating."

VESSEL BUNKERING.—Report all fuel oil and diesel oil sold for ships bunkers and other marine purposes including own-company use. Exclude sales to the Armed Forces.

MILITARY USE.—Include all fuel oil sold to the Armed Forces, regardless of use.

ELECTRIC UTILITY COMPANIES.—Include all fuel oil sold to electric utility companies, including that used for the generation of electricity.

ALL OTHER USE.—Include agriculture, and any other use category not specified on the form.

INVENTORIES.—Report all beginning and ending inventories held by your company for the year indicated on form. Report on a custody basis regardless of ownership of these inventories.

GPO 830-066